AUGUST 1954

BULLETIN

OF THE NEW YORK ACADEMY OF MEDICINE

Original Articles
by

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A Symposium

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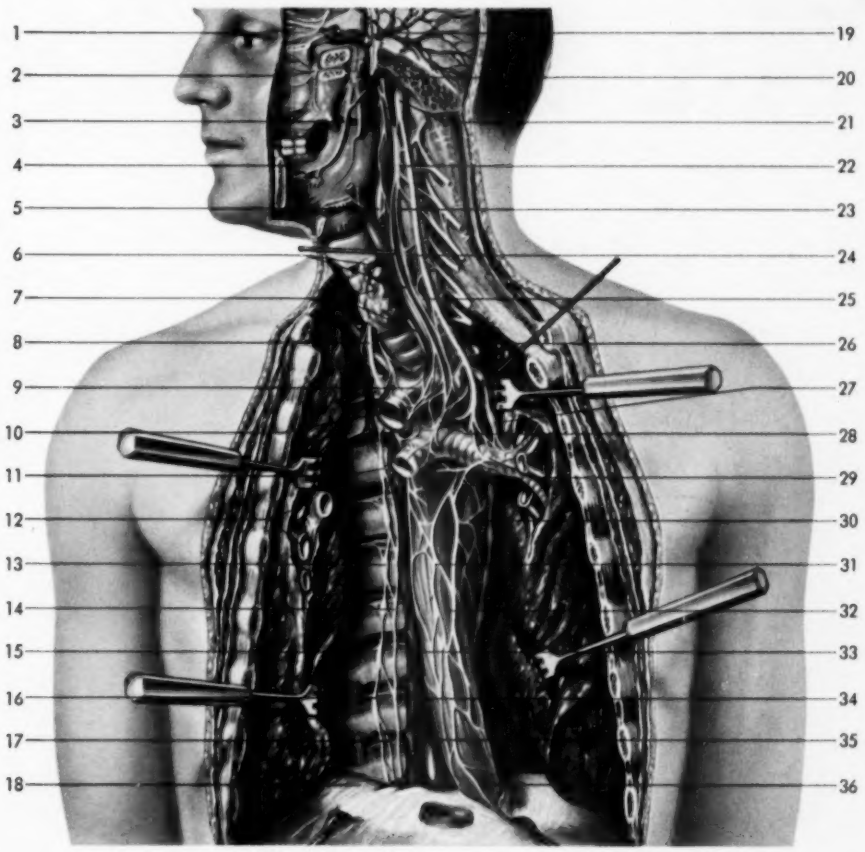

1 Ciliary ganglion
2 Sphenopalatine ganglion
3 Lingual nerve
4 Submandibular ganglion
5 Internal carotid artery
6 Common carotid artery; superior cardiac nerve
7 Thyroid gland; recurrent laryngeal nerve
8 Right vagus nerve
9 Aortic arch
10 Superficial cardiac plexus
11 Fifth thoracic sympathetic ganglion
12 Pulmonary artery and vein
13 Seventh thoracic sympathetic ganglion
14 Greater splanchnic nerve
15 Intercostal artery, vein and nerve
16 Tenth thoracic sympathetic ganglion
17 Lesser splanchnic nerve
18 Diaphragm
19 Trigeminal nerve
20 Otic ganglion
21 Nodose ganglion
22 Superior cervical sympathetic ganglion
23 Cervical sympathetic trunk
24 Middle cervical sympathetic ganglion
25 Inferior cervical sympathetic ganglion
26 Left vagus nerve
27 Fourth thoracic sympathetic ganglion
28 Cardiac ganglion
29 Anterior pulmonary plexus
30 Aortic plexus
31 Esophageal plexus
32 Esophagus
33 Azygos vein
34 Splanchnic ganglion
35 Aorta
36 Anterior gastric cord of vagus

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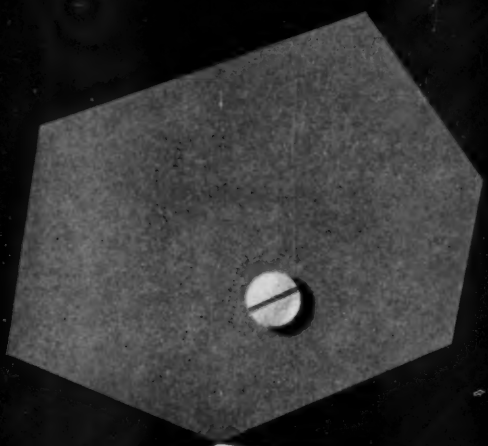

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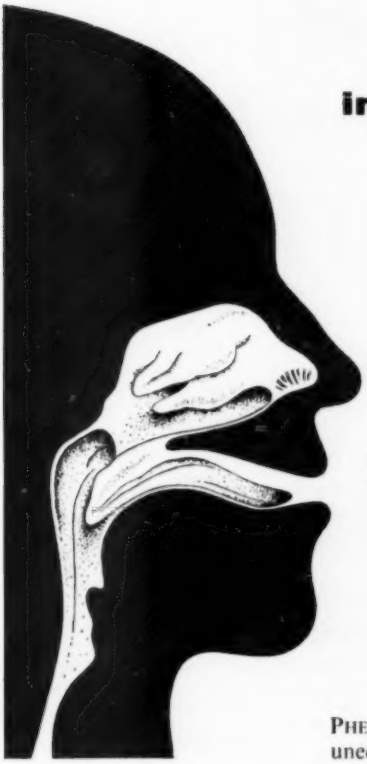

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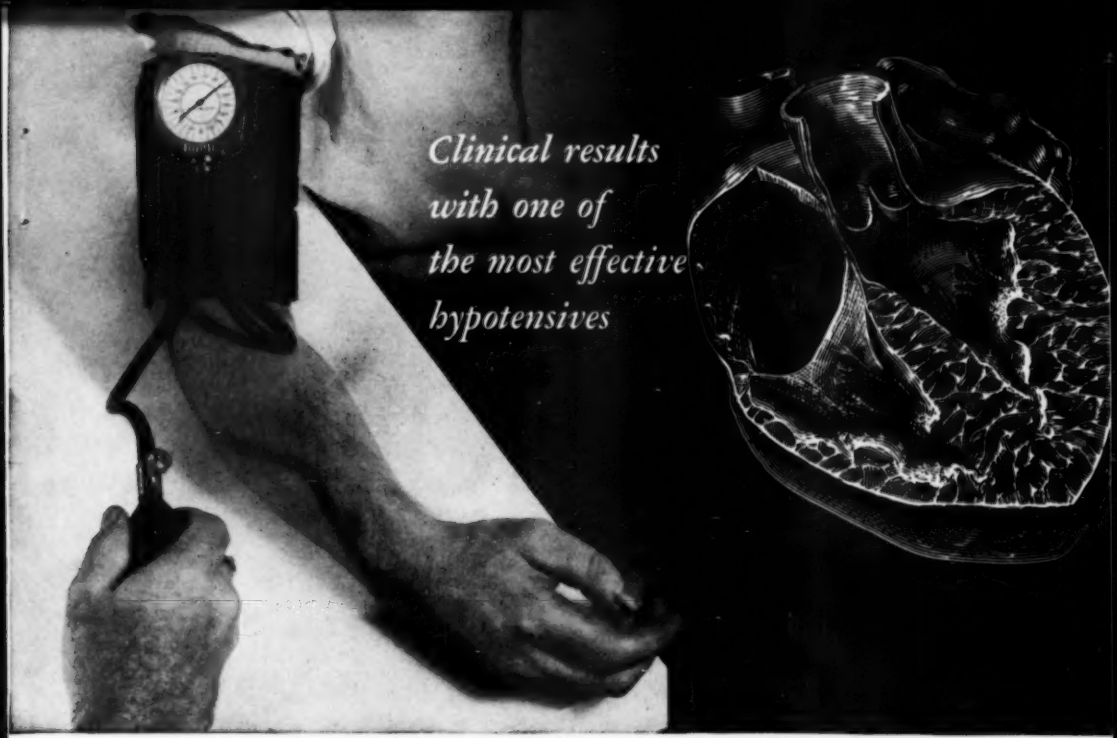
1. Holland, M. H.: J. Med. Soc. New Jersey 49:469, 1952.
2. Grayzel, H. G., Heimer, C. B., and Grayzel, R. W.: New York St. J. M. 53:2233, 1953.



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1. Moyer, J. H.; Miller, S. I., and Ford, R. C.: J.A.M.A. *152*:1121 (July 18) 1953.
2. Moyer, J. H.; Snyder, H. B.; Johnson, I.; Mills, L. C., and Miller, S. I.: Am. J. M. Sc. *225*:379 (April) 1953.
3. Kuhn, P. H.: Angiology *4*:195 (June) 1953.

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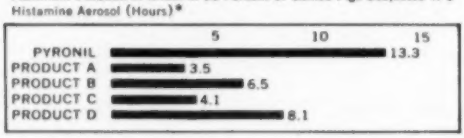

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ROBERT L. CRAIG, *Editor*

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BULLETIN OF
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VOL. 30, NO. 8 AUGUST 1954

THE LYMPHOMAS AND LEUKEMIAS*

The First Harlow Brooks Lecture

NATHAN ROSENTHAL

Consulting Hematologist, The Mount Sinai Hospital, New York; Formerly Associate Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University

It is indeed an honor to be selected to give the first Harlow Brooks lecture at the Academy of Medicine. Dr. Harlow Brooks was well known in this community for his interest in the lymphomas as a clinical pathologist and, later, in the capacity of an eminent internist and consultant. His biography by Dr. Moorhead[1] mentions many other activities in which Dr. Brooks engaged. He had a life-long interest in the American Indians and made frequent visits to the reservation of the Navajos and became interested in their medical conditions. He was impressed by the paucity of malignant disease among this primitive people.

In this connection, the beginning of medical interest in the lymphomas starts with Thomas Hodgkin[2] who, like Dr. Brooks, started as a pathologist and later became an internist, and who also showed a similar interest in the American Indians. He showed a marked sympathy for their general welfare as well as for other minority and underprivileged groups. Dr. Hodgkin was the pathologist at Guy's Hospital in London

* Presented at the 26th Graduate Fortnight of The New York Academy of Medicine, October 27, 1953.

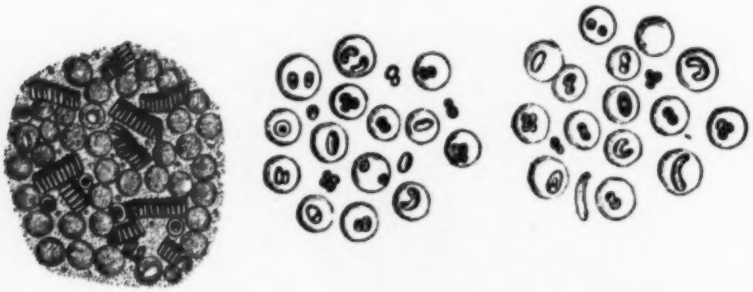

Fig. 1. Microscopic appearance of blood in a case of leukemia reported by Bennett[4] in 1852.

when he first described in 1832 seven cases of generalized lymphadenopathy and splenomegaly. He stated that ". . . this enlargement of the glands appears to be a primitive affection of these bodies." His gross description of the spleen was typical of the disease which bears his name. A microscopic study of the original cases by Fox[3] proved that at least three of the cases were typical of the disease.

It was several years later, in 1845, that leukemia began to be recognized as a definite entity by John H. Bennett[4] and Rudolpf Virchow[5] in their reports of this disease. The first monograph on leukocythemia or white cell blood was published by Bennett in 1852[4] in which the first illustration of the microscopic appearance of the blood in leukemia was shown (Fig. 1). The first photograph of a patient with leukemia was published by Damon[6] in 1862 (Fig. 2).

At first two types were described: 1) leukemia with enlargement of the spleen and 2) leukemia with enlargement of the lymph nodes. It was in 1870 that Neumann[7] called attention to the involvement of the bone marrow. A new epoch in leukemia started, however, with the introduction of staining methods for the identification of blood cells by means of special blood stains by Ehrlich and his co-workers.[8] Ehrlich differentiated by means of his staining methods two types of leukemia, namely, the lymphatic and myelogenous. This displaced the old classification which was based on gross anatomic lesions of the lymph nodes and spleen. Further additional studies by Naegeli[9] who identified myeloblasts in 1900, and further improvements in the staining methods by Pappenheim[10] led to the idea that the two main forms of leukemia were general-

Fig. 2. First photograph of a patient with leukemia, Damon[6] 1862.

ized in nature. At first leukemia was considered chronic in type, but in 1857 acute leukemia was first described by Friedreich.[11]

In addition to the two main types of leukemia, namely, lymphoid and myeloid, a third type, monocytic leukemia, was reported by Reschad and Schilling.[12] This was not accepted by many hematologists who considered this a form of myeloid leukemia.[13] On the other hand, two additional forms of leukemia are now being recognized, namely, the reticulum[14, 15] and the hematogonic type.[16]

The underlying cause of leukemia as well as lymphomas is still unknown. Hyperplastic tendencies in the hematopoietic tissues with marked tendency of immaturity of the cells give rise to the impression of a neoplastic disease. This has led to various theories concerning the cause of lymphomas and leukemias: 1) A neoplastic-like disturbance in the

function of the main systems of the blood-forming organs is reflected by hyperplasia and abnormal maturation in myeloid and lymphoid tissues. 2) It is also believed that leukemia may be caused by filterable virus. This has been demonstrated by Ellermann and Bang[17] in chickens and recently by Ludwik Gross[18] in leukemia in mice. The course of some cases of acute leukemia would tend to simulate the virus disease. 3) The appearance of the bone marrow in most cases of leukemia is most striking in that there is a tendency toward immaturity. In some cases the bone marrow may be dominated by generalized hyperplasia of myeloblasts with very little differentiation into maturer forms. For this reason one may postulate that it is some form of a deficiency disease or maturation arrest.

Today, as a result of the contributions made by investigators in various fields throughout the world, the studies of the lymphomas and the leukemias have become of widespread interest from various aspects. Of late, it is the hematologist who carries out most of the work on these patients. He studies not only the peripheral blood but taps the inner organs, such as the bone marrow, the lymph nodes, the spleen and the liver, not only for diagnosis but for the changes which take place during the course of the disease, especially as affected by treatment. Not only are blood smears or organ smears studied, but sometimes sufficient material is obtained by aspiration for sections in order to study the actual histology of the tissue. Although these examinations are sufficient for the leukemias, it is also necessary to perform biopsies of the lymph nodes for the diagnosis of the lymphomas.

There is much to discuss concerning these diseases, with respect to their incidence, their variations and especially their classification. This also applies to the various types of cells which one encounters in the different forms of the lymphomas and the leukemias, which are of importance in characterizing the type of disease under discussion. The various forms of treatment, irradiation and chemotherapy, are important in their effect on the life span in the various types of leukemias.

It is impossible for me to discuss all aspects of these diseases with any degree of completeness in one lecture. I shall endeavor to present to you some of the main problems which have been of particular interest to me during the past thirty years.

The classification, duration of illness and age of onset of the leukemias have always been of general interest. I shall discuss these factors

TABLE I. THE LYMPHOMAS

Type	*Average course yr.*	*Incidence in Present Series*	
		Number	*%*
Reticulum cell sarcoma	1.3	2	.3
Lymphocytic (Lymphosarcoma)	3.2	8	1.3
Hematogonic (Follicular Lymphoblastoma)	5.6	15	2.6
Hodgkin's disease	4.2	19	3.3

based on an analysis of 581 cases in which death occurred over the past seven years. The criteria used for the classification of the various types of lymphomas and leukemias were as follows:

1. *Clinical:* This consisted of a study of the acuteness or chronicity as determined by the onset and severity of symptoms.

2. *Physical Examination:* The presence of lymphadenopathy and splenomegaly are variable but seem to occur more frequently in the lymphomas than in the chronic leukemias. The lymph nodes and spleen are less frequently enlarged in the acute leukemias and occasionally in some lymphomas.

3. *Cellular Differentiation:* The most important criteria in diagnosis depend upon the increase or immaturity of the leukocytes present in the peripheral blood and in smears obtained by puncture of bone marrow,[14] lymph nodes[19, 20] and the spleen.[21, 22]

The lymphomas[23] are closely related to the leukemias with the exception that the blood is not affected by the typical cells identifying the underlying condition. As far as the cells are concerned, they are the various types of maturation forms which one would expect to find in lymph nodes, namely, reticulum cells, lymphocytes and hematogones. In this manner such cells could be identified in lymph node punctures but not found in most cases in the bone marrow. Identical cells, however, can be found in the blood and bone marrow and lymph nodes in the leukemias which indicates that there is a close relationship between both main groups.

The lymphomas may be divided into four main groups, as shown in Table I, depending on the cell type whose proliferation is responsible

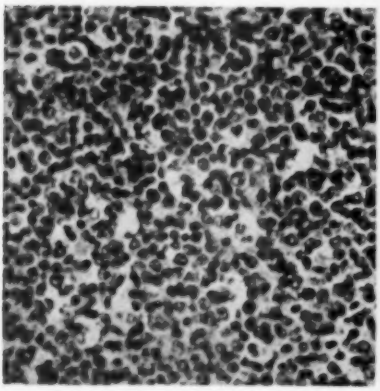

Fig. 3. Reticulum cell sarcoma; section of lymph node (x250).

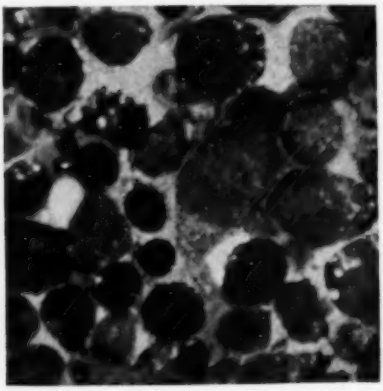

Fig. 4. Reticulum cell sarcoma; smear of lymph node aspirate showing cellular detail and a predominance of reticulum cells (x1000).

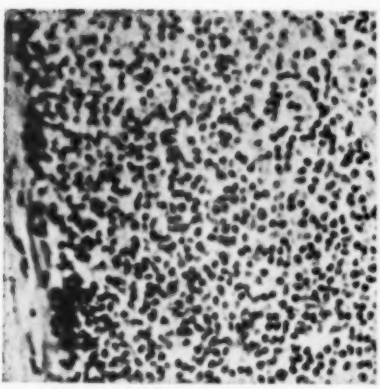

Fig. 5. Lymphosarcoma; section of lymph node (x250).

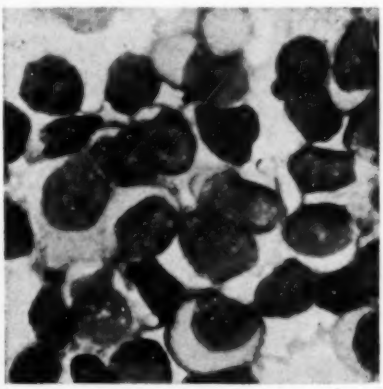

Fig. 6. Lymphosarcoma; smear of lymph node aspirate (x1000).

for the enlargement of the lymph nodes and the spleen. In some cases the bone marrow may also show similar involvement. In all these conditions the blood is considered to be non-diagnostic. The four cell types and their corresponding lymphomas are: 1) the primitive type, called reticulum cell lymphosarcoma (Figs. 3, 4); 2) the more mature type, lymphoblastoma or lymphosarcoma (Figs. 5, 6); 3) the hematogone, a peculiar type of cell present in lymph nodes (Figs. 7, 8), the basis of

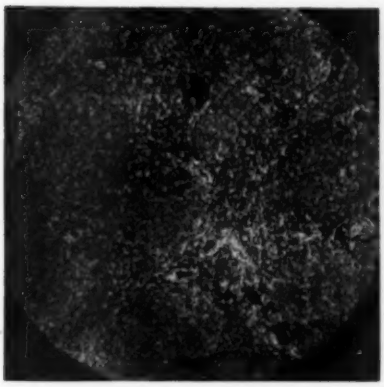

Fig. 7. Follicular lymphoblastoma; section of lymph node (x100); note the characteristic large follicles.

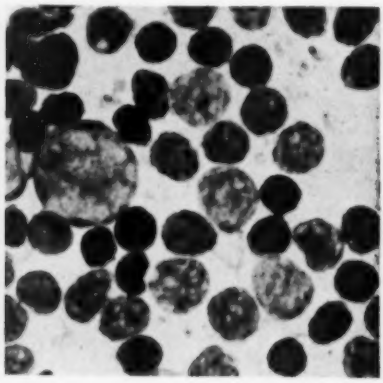

Fig. 8. Follicular lymphoblastoma; smear of lymph node aspirate (x1000), note the predominance of hematogones, which have a homogeneously staining nucleus and almost a complete absence of cytoplasm.

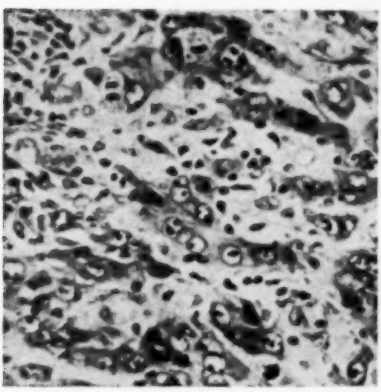

Fig. 9. Hodgkin's disease; section of lymph node (x250).

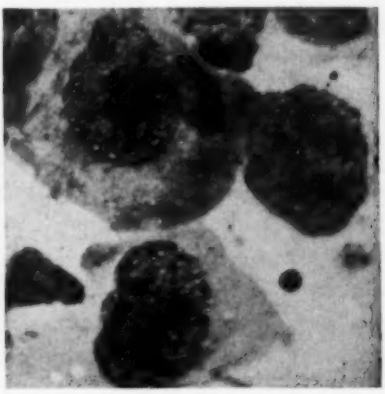

Fig. 10. Hodgkin's disease; smear of lymph node aspirate (x1000), note the large Dorothy Reed cells with prominent nucleoli.

follicular lymphoblastoma; 4) the Reed-Sternberg cell, an abnormal reticulum cell, always associated with Hodgkin's disease (Figs. 9, 10).

These conditions may be identified not only in histological sections but also by careful study of cells obtained by aspiration of a lymph node, or by imprints from lymph nodes obtained at biopsy. The study

TABLE II. LEUKEMIAS OF MYELOID ORIGIN

Type	*Course*	*Incidence in Present Series* *Number*	*%*
Myeloblastic	Acute	215	37.0
Monocytoid myeloblastic	Acute	60	10.3
Myelocytic	Chronic	84	14.4
Plasma cell	Acute	7	1.2
Plasma cell myeloma	Chronic	20	3.4
Reticulum cell	Chronic	3	.5
Myelofibrosis	Chronic	22	3.8

of cytology of the cells in the lymph nodes which has been much neglected in the past may be extremely valuable, as shown in Figures 4, 6, 8 and 10. The diagnosis can best be established by combined study of the imprints and the sections (Figs. 4-10).

Another neglected adjuvant in the study of the lymphomas is the examination of the bone marrow. In many cases, the bone marrow shows no involvement. In the first three types of lymphomas, reticulum cell lymphosarcoma, lymphosarcoma and giant follicular lymphoblastoma, definite bone marrow changes may occur, indicating a lymphomatous condition. If the bone marrow is involved, the blood may show leukemic changes later in the course of the disease, indicating that these three conditions are closely related to leukemia: reticulum cell leukemia, lymphocytic leukemia and hematogonic leukemia.

The fourth type of lymphoma, namely, Hodgkin's disease, is much more restricted to the lymph nodes and spleen and rarely involves the bone marrow. In contrast to the other types of lymphoma, there is no leukemic counterpart to Hodgkin's disease. Study of the lymph nodes reveals variations in the involvement of the reticulum leading to the formation of abnormal cells of various sizes, large or small Reed-Sternberg cells, accompanied by other changes such as infiltration with eosinophils and formation of fibrous tissue.

THE LEUKEMIAS

The leukemias are related to the lymphomas in that the same organs are involved: the lymph nodes, the spleen and the bone marrow. In

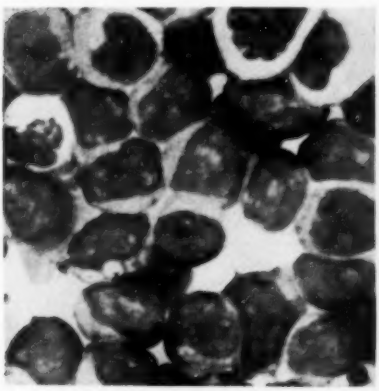

Fig. 11. Myeloblastic leukemia; bone marrow (x1000), predominance of a uniformly anaplastic blast cell with 1 to 5 nucleoli.

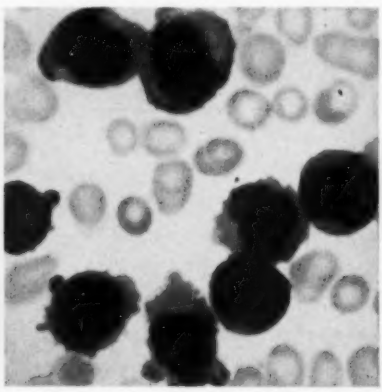

Fig. 12. Monocytoid myeloblastic leukemia; blood (x1000), young blast cells with the nucleus folded to varying degrees to give the monocytoid appearance.

addition this involvement is reflected in changes in the white cells of the blood, either in number or variations in the types of cells. There may occur an increase in normal cells as in lymphocytic leukemia, or immature cells as in myelocytic, myeloblastic leukemia, reticulum cell or plasma cell leukemia.

As a result of these variations, leukemias have been classified in three ways: 1) According to the number of cells, such as leukopenic leukemia, in which the number of cells is less than 15,000 and the leukocythemic form, in which there is definite increase in white cells from 15,000 to 1,000,000; 2) According to the type of cells involved: namely, lymphocytic leukemia, hematogonic leukemia, lymphoblastic leukemia, myeloblastic leukemia, monocytoid, progranulocytic leukemia, myelocytic leukemia, reticulum cell leukemia and plasma cell leukemia; 3) According to the course of the disease: acute or chronic. These are arbitrary terms and sometimes may be misleading, since some cases with the morphological picture of acute myeloblastic leukemia may run a chronic course. Similarly, cases classified by morphology as chronic cases may run an acute course.

The important criteria for the diagnosis of leukemia are: first, examination of the blood, and second, the bone marrow. Both are of equal importance and the tendency at present is to confirm the diagnosis by

TABLE III. LEUKEMIAS OF LYMPHOID ORIGIN

Type	*Course*	*Incidence in Present Series* *Number*	*%*
Lymphoblastic	Acute	14	2.5
Lymphocytic	Chronic	106	18.3
Hematogonic (Follicular Lymphoblastoma)	Chronic	6	1.0

bone marrow aspiration not only in obscure cases but also in well-defined conditions, in order to have a base-line by which to judge remissions and relapses, and variations under treatment. The bone marrow may sometimes be involved before the blood changes occur, especially in myeloblastic leukemia. In certain obscure conditions, the bone marrow examination may differentiate the various types of lymphoma, leukemia and leukemia-like diseases, especially myelofibrosis and plasma cell myeloma.

Myeloid Leukemia: Table II lists the different types of leukemia of myeloid origin. The acute types, myeloblastic and monocytoid myeloblastic, are more frequently encountered than are the chronic types, particularly myelocytic. The recognition of these leukemias and their clinical course are well known. In myeloblastic leukemia, however, the morphology of the immature cells can be quite variable and bizarre, with different degrees of maturation, size and granulation (Figs. 11, 12). No two cases are alike. The cells in the bone marrow tend to be more uniform than those in the peripheral blood.

Lymphoid Leukemia: Table III lists the three types of lymphoid leukemia: lymphoblastic, lymphocytic and hematogonic, the latter being related to follicular lymphoblastoma. Lymphoblastic leukemia is relatively rare, whereas the incidence of lymphocytic leukemia is frequent. These types are illustrated in Figures 13, 14 and 15.

Hemolytic anemia is an occasional and interesting complication of the leukemias. While it is rarely seen in acute and chronic myelocytic leukemias, it is more frequently encountered in chronic lymphocytic leukemia and may be responsible for the severe anemia in about 5 per cent of the cases. It occurs in two forms: one, in which all the signs of hemolytic anemia are present, namely, icterus, reticulocytosis and increase of urobilinogen in the urine and a positive Coombs test; and, as more frequently seen, the sudden appearance of a severe anemia with-

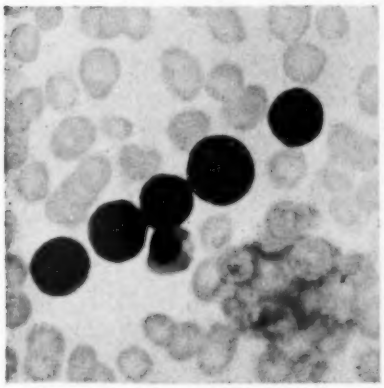

Fig. 13. Lymphoblastic leukemia; blood (x1000).

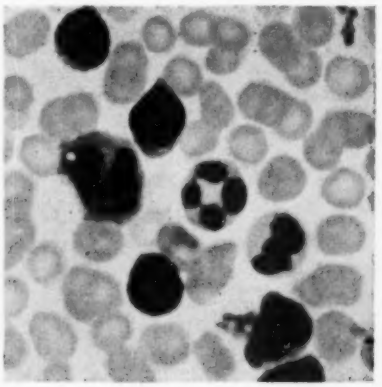

Fig. 14. Lymphocytic leukemia; blood (x1000).

out reticulocytosis and icterus but with a positive Coombs reaction. Both forms of chronic lymphocytic leukemia with a positive Coombs reaction can be improved with treatment by means of ACTH or cortisone. Such treated patients will show a gradual reduction in the titer of the Coombs reaction, which may become negative.

There is thus a distinct relationship[24] among the various types of enlargement of lymph nodes and spleen, and hyperplasias of the bone marrow. All these diseases, however, must be considered as clinical entities at the present time, and the so-called changes from one to the other must be subject to some doubt. In a few cases in which the diagnosis of one condition was made, and later another appeared, early study of the cells from imprints was of great value in proving that the condition had not in fact changed. In this connection I may call attention to two cases of this type, in which a diagnosis of Hodgkin's disease was made. One patient was treated for this disease with radiotherapy, and finally the condition terminated in myeloblastic leukemia. In this particular case, re-study of lymph node smears revealed that the cells considered as Reed-Sternberg cells by the pathologist were megakaryocytes, and, apparently, myeloid metaplasia of the lymph nodes preceded the leukemic phase.

In another instance, a patient developed small lymph nodes in the neck and had a marked monocytosis in the blood. The bone marrow

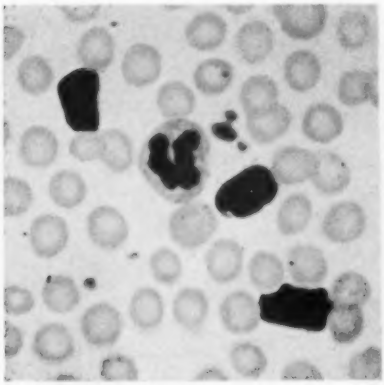

Fig. 15. Hematogonic leukemia; blood (x1000), presence of hematogones in the blood.

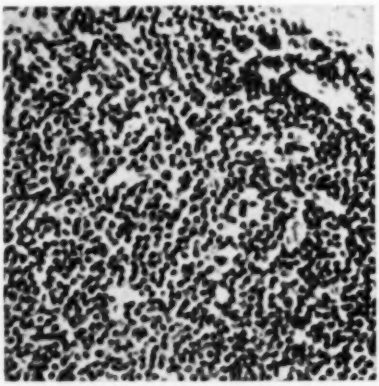

Fig. 16. Lymphocytic leukemia; section of lymph node (x250), compare with follicular lymphoblastoma in Fig. 7.

was not abnormal. Succeeding studies revealed no changes in the marked monocytosis, and finally, a biopsy of a lymph node was performed. This was reported as Hodgkin's disease. Imprints, however, revealed that there was a myeloid metaplasia in which there were scattered megakaryocytes, and the lymphoid cells had the appearance of myeloblasts. Later, a monocytoid myeloblastic leukemia supervened, and the bone marrow then became typical of a myeloblastic leukemia.

The interrelationship of lymphoma and leukemia is best illustrated by follicular lymphoblastoma. At first,[25] this disease was considered to be of benign character, in which the lymphadenopathy was characterized by marked increase in size and number of follicles. Originally, it was considered to involve only the lymph nodes and the spleen. Later some cases were seen to be accompanied by leukemia.[26] Further studies of such cases have indicated that there are possibly three types of this condition: one in which the lymph nodes and spleen alone are involved; another in which the lymph nodes, spleen and bone marrow show evidence of the disease; and a third form with involvement of the blood in addition to the previously mentioned tissues (Figs. 7,8).[16]

In these cases, the study of smear or imprint preparations of cells obtained from lymph nodes, spleen, bone marrow and blood, reveals that one type of cell predominates, namely, the hematogone, which is a lymphoid type of cell. Hematogones are normally found in varying

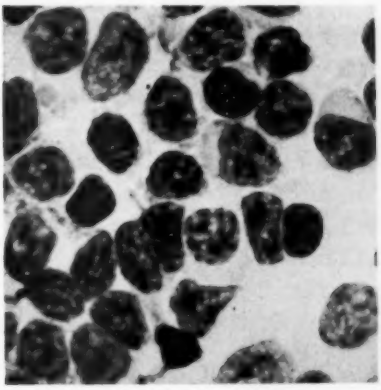

Fig. 17. Lymphocytic leukemia; smear of lymph node aspirate (x1000), consists chiefly of mature lymphocytes; compare with the hematogonic infiltration as seen in follicular lymphoblastoma and hematogonic leukemia, Fig. 8.

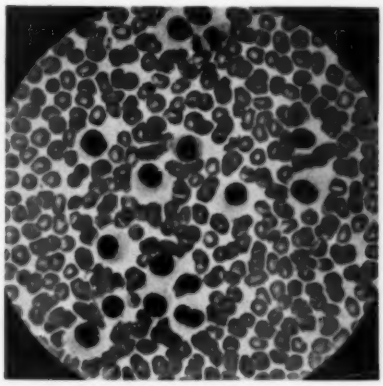

Fig. 18. Reticulum cell leukemia; blood (x800), marked by the presence of reticulum cells.

numbers in normal lymph nodes, bone marrow, and the blood of infants. They may be present in small numbers in the blood, bone marrow and lymph nodes of patients with lymphocytic leukemia. Figures 16 and 17 show a lymph node section and aspiration in lymphocytic leukemia.

There is also a similarity between reticulum cell lymphosarcoma and reticulum cell leukemia, and possibly reticulum cell tumors of the bone. This may be illustrated by one case in which a tumor of the bone appeared following an injury. The patient was hospitalized, and a biopsy of the bone tumor was reported as reticulum cell lymphosarcoma. Later this patient was thought to have lymphocytic leukemia, when he developed an increase of lymphocytes in the blood. Further study of this patient indicated that the cells in the blood were reticulum cells (Fig. 18) and not lymphocytes. The bone marrow also revealed a large percentage of reticulum cells. These findings were consistent with the criteria of reticulum cell leukemia.[14] This also illustrates that it is again most important to pay particular attention to cytology in studying smears in order to identify the various unusual types of lymphoma and leukemia.

The reticulum in the bone marrow, lymph nodes, spleen, liver and sometimes other areas, forms a primitive tissue which is capable either

normally or in abnormal states of forming immature and normal blood cells, plasma cells and endothelial cells as well as fibrous tissue. Similarly, the reticulum is the precursor of the macrophages, where abnormal proliferation and storage of various lipids may give rise to such entities as Niemann-Pick's disease, Gaucher's disease and Hand-Schüller-Christian's disease. The different types of lymphoma and leukemia arise from the reticulum cells themselves and form all of the various cell types, elaborated during the course of maturation. For this reason, rare forms of leukemia, especially reticulum cell leukemia and plasma cell leukemia may occur.

It may also be possible that the bone marrow reticulum may lose its granulopoietic potency and form fibrous tissue instead.[27] This will give rise to osteosclerosis or myelofibrosis with myeloid metaplasia of the spleen. The blood in such cases does not show an increase of white cells, but a differential count resembling myelocytic leukemia. There is a variable number of red cells, with marked anisocytosis and especially elliptical cells or the tear-drop cells. Bennett[4] presented an illustration of these cells in describing a case of hypertrophy of the spleen. It is in such cases that puncture of the marrow yields very little. Smears are usually hypoplastic and show a normal differential count with no increase of myelocytes as in the usual form of myelocytic leukemia. The puncture of the spleen reveals myeloid metaplasia as indicated by scattering of the myelocytes, megakaryocytes and nucleated red cells. This syndrome may also appear in a late stage of polycythemia vera.[28]

The fact that plasma cell leukemia occurs makes one consider that multiple myeloma, in which the bone marrow is similarly involved, must also be classified as an aleukemic leukemia. In some cases, multiple myeloma may affect the spleen and the lymph nodes without apparent blood changes. This disease thus resembles lymphosarcoma which may involve only lymph nodes and spleen or may be more generalized and affect the bone marrow and peripheral blood.

Incidence of Leukemia and Lymphomas

A definite increase in the number of cases of leukemia has been noted in the past twenty years. In a review of 455 cases in 1935, we have been impressed by the steady rise of leukemia from year to year.[29] Bethell[30] in a review of 495 cases noted a rising incidence of leukemias admitted to the Simpson Memorial Hospital at Ann Arbor, Michigan. Sacks and

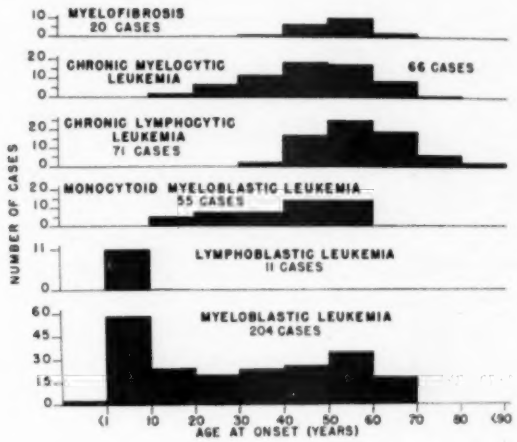

Fig. 19. Chart of the age of onset of the various types of leukemias based upon a series of patients dead 1947 to 1953.

Seeman[31] reported a rise in death rate from leukemia in the United States from 1.9 in 1920 to 3.7 in 1940, per 100,000 population. More reliable data were compiled by Gilliam[32] from the National Office of Vital Statistics. He found that the death rate per 100,000 population in the United States in 1949 was 5.4 for leukemias and 4.9 for lymphomas. In a survey of the incidence of leukemia in Edinburgh and Aberdeen, Gauld and his co-workers[33] have found a twofold increase in that area between 1938 and 1951. This rising incidence of leukemia is attributed to use of better diagnostic laboratory procedures and especially to the use of bone marrow puncture. Furthermore, the use of antibiotics has probably brought about a prolongation of life and may account for some increase in leukemia in older people. There seems to be some agreement that there is a definite rise in the number of lymphomas and leukemias. This is not influenced to any extent by the small number of cases due to Benzol or exposure to x-ray, especially in the case of physicians and technicians. Exposure to atomic weapons may also predispose to leukemia, as recently reported by Folley, Borges and Yamawaki.[34]

Age Distribution: Leukemia may occur from birth to advanced age, as is shown in Figure 19. An occasional case of myeloblastic leukemia may occur in a patient less than one year of age. Lymphoblastic leukemia may occur in appreciable numbers of children between one and

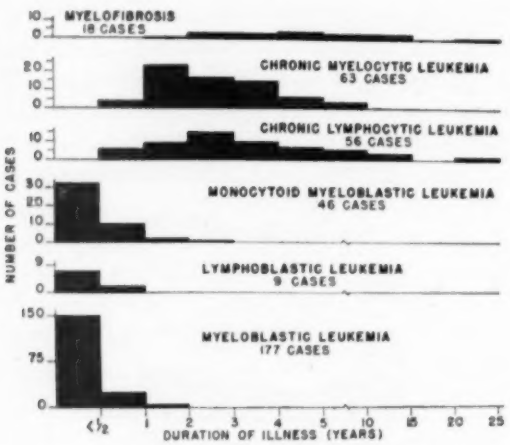

Fig. 20. Chart of the duration of the course of various leukemias in the present series of cases.

ten years of age. Chronic myelocytic leukemia may also occur in rare instances between three and ten years of age. In this age interval, chronic lymphocytic leukemia is rarely encountered. Between the ages of ten and seventy, all the other forms of leukemia may occur. Chronic myelocytic leukemia is more common between the ages of forty and fifty, whereas myeloblastic leukemia and myelofibrosis are more frequently seen between the ages of fifty to sixty. Chronic lymphocytic leukemia is most commonly found in later life.

Sex Distribution: As we and other investigators have already observed, leukemia is more frequently encountered in males than in females.

Life Span of the Lymphomas and Leukemias: The duration of the various forms of leukemia divides them sharply into two main groups, as shown in Figure 20, the acute form, in which immature cells are usually present and in which the duration of the disease is usually less than one or two years, and the chronic form which usually lasts longer than two years. Since the myeloblastic leukemias form the largest percentage of acute cases, one can obtain some information as to the usual span of this disease. More than 50 per cent of the cases usually succumb in less than four months from the onset. Few of these cases survive for one year, and, rarely, two to three years. In monocytoid myeloblastic leukemia, the survival time is even shorter. Most of the patients live barely beyond

six months. Occasional cases, however, have lived as long as four years.

The chronic cases, as shown by many investigators, have a certain well-defined survival period. According to our study, 50 per cent live from one to three years from the onset of the disease. Fewer patients survive beyond this period, and even fewer survive after the five-year period. In myelofibrosis of the bone marrow, which resembles chronic myelocytic leukemia except that the white cells are not increased and the bone marrow is fibrotic and not hyperplastic, the duration of the disease is much longer and may vary from three to twenty-five years. Chronic lymphocytic leukemia fares somewhat better in the duration of the disease in that an appreciable number may live beyond the three-year period and occasionally, up to twenty-five years. One of the patients in the present series showed a complete remission of leukemia after treatment with Urethane. The leukemic phase was present for seven years, and the patient was free of the disease for two years prior to his death from cardiac decompensation. No evidence of the disease was found in the blood or bone marrow. We have observed two similar cases in which a reversal to a normal state occurred.

Summary

The leukemias and lymphomas have been discussed from various aspects: diagnosis, interrelationships and individuality, incidence, etiology, age of onset and duration of disease. This discussion is based in part upon an analysis of 581 patients who died in the past seven years. Emphasis has been placed upon the value of lymph node aspiration in addition to the usual modes of study in the identification and classification of the lymphomas and leukemias. Two new types of leukemia have been described: reticulum cell leukemia and hematogonic leukemia. The former type runs a chronic course and must be differentiated from reticulum cell sarcoma. The latter is closely related to follicular lymphoblastoma and may be confused with lymphocytic leukemia.

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THE ACQUIRING AND IMPARTING OF MENTAL HEALTH*

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In a comprehensive view of the problems of mental health and disease, there is room and need for the consideration of many special topics. From a professional and scientific viewpoint it is fascinating to study the forms and patterns of mental illness. The fruits of such psychopathological study have been of much value in the struggle against mental illness. The history of medicine gives one much ground for the belief that scientific studies of mental illness, supported by more adequate funds, and carried forward by investigators of greater talents and skills, will bring a greater and greater measure of knowledge and power in the fight against these dreaded disorders. Parallel with such studies, and of comparable basic importance, is the study of the positive forces making for mental health. It is from this positive viewpoint of mental health that I am to speak this evening.

It has been my good fortune, as a physician, to have been acquainted with hundreds, even thousands, of persons during critical periods of their lives when they were earnestly engaged in the successful process of regaining mental health. My acquaintance with some has been intensive enough to give me a fairly clear idea of the steps involved in recovery. This experience has given me a profound respect for the capacities of the human spirit. This experience has been in no way unique to me as an individual. It is an experience shared by large numbers of my fellow psychiatrists. Even in the large public mental hospitals, where conditions are less favorable than in a university clinic or private hospital, improvement is the rule, and not the exception. The processes and forces making for mental health are therefore available for the study and have, in fact, received much attention, although

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relatively little has been published. It is a matter of considerable complexity and difficulty to apply scientific methods of study to these health building processes. In the clinic where I work, a special group has been intensively engaged in the development of methods for identifying, characterizing and, we hope in time, controlling and utilizing more effectively the forces and processes involved in the rebuilding of mental health.

In this presentation it is not my intention, however, to discuss the scientific methodology of such study, but ratner to present, quite simply, some of the thoughts which have come out of personal observation and reflection.

First, I should try to make it clear that the psychiatrist when choosing to comment upon the favorable outcome of his patients from a period of illness, is not presumptuously boasting about the cures which he has achieved. One is compelled by honesty to speak with great humility about such good fortune, as experiences in which one has been privileged to participate. In more positive terms, the recovery process has impressed me as a process by which the patient regains inner freedom and spontaneity, and escapes from inner constraints and crippling apprehensions. As I have sought for some insight into the beginnings of the process of recovering mental health, I have been repeatedly impressed by the significance of interpersonal transactions in favoring recovery. The type of interpersonal relationship which has received the largest share of systematic study has been the doctor-patient relationship, but this is not the only significant one. The doctor-patient relationship is, in fact, surrounded by special difficulties. The most obvious difficulty arises from the authoritative position of the doctor, and the special difficulties which patients experience in their inner emotional adjustment to authority. By the same token, a truly corrective emotional experience in this special context, has very great potential significance for the development of inner freedom.

The position of importance here given to interpersonal transactions, as initial phases in rebuilding mental health, strongly suggests an analogy with infectious processes, as if some principle of mental health were communicable. Perhaps, in time, we will develop a science of the epidemiology of health, analogous to the epidemiology of disease, and thus increase the possibilities for intelligent control of the processes involved.

Observations of the initiation, growth and spread of the improvement process in patients in hospitals has also strongly impressed upon me the constructive values gained from patient to patient. Even in a fairly sick hospital population, the germs of health,—to continue our epidemiological metaphor,—are found in considerable abundance and vitality, and their transmissibility may perhaps be heightened by the sense of companionship in distress. I realize that many find this to be a startling concept. It runs counter to much popular belief. Innumerable relatives of patients have expressed to me their troubled concern lest the particular patient in whom their interest centers be seriously depressed and unfavorably influenced by close association with other sick persons. There are, indeed, degrees of closeness of association which can be quite detrimental. A heavily overcrowded ward is not the most suitable milieu for the cultivation of the interpersonal forces that favor improvement. But there is a large empirical experience in support of the proposition that positive constructive forces do grow up in the interpatient relationships, which serve, so to speak, as foci of healthy and constructive processes. It is not too strange, after all, that the experience of improvement shared with others should be a positive morale factor.

While stressing the basic importance of the recovery process in relation to mental illness and health, I would not like to seem to give it a unique position, peculiar to mental health alone. Through the whole range of medical concern—in all the problems of sickness and health—the reparative processes are of fundamental importance. Over the whole extent of surgical treatment, for example, success depends upon the reparative potentialities of the tissues, and successful surgery depends upon the wise treatment of tissues and the understanding of their reparative capacities.

To gain another point of vantage for viewing the significance of positive health-forces, permit me to digress a moment for the brief delineation of one concept of mental illness. Serious mental illness—whether of a psychotic or neurotic type—may be usefully considered as a serious delay in the restoration of mental balance. According to this view, some disturbance of mental and emotional balance is a wellnigh universal phenomenon. Our statistical knowledge of mental illness is, of course, based upon reported cases. The clearest figures are those for admission to mental hospitals. Such admissions are not arranged

unless the deviation from mental health is rather severe and rather prolonged.

Calculations from current experience in this State (New York), as reported by Goldhamer and Marshall,[1] indicate that a newborn citizen has approximately one chance in twelve of being admitted to a mental hospital some time during his life.

Physicians of broad experience have said that at least an equal number of persons who are not admitted to hospitals have periods of mental illness of comparable severity, and perhaps even greater chronicity. And the rest of us,—the remaining ten-twelfths of the population presumptively normal,—in what does our "normality" consist? Some would say that the normality of the normal—from the standpoint of mental health—does not consist in complete immunity, but in relative resilience,—that we all have some moments of aberration, from which some of us right ourselves more promptly than do others. Recovery is fortunately pretty prompt for most of us. Touches of morbidity, like touches of genius, make the whole of mankind akin, and give us all at least a fleeting share in the whole range of potential human experience. In these day-by-day humdrum balancing acts, we have intimate acquaintance with the recovery process. The human being is not equipped with clear inward eyesight, and usually does not recognize, still less understand, the processes which restore his balance. Fortunately, these recovery processes operate in the main, pretty well, without our conscious surveillance, and it is only when recovery is seriously impeded that we observe the phenomena to which we give the name mental illness. A consideration of the many kinds of causes—motivational and organic—which may impede recovery, would lead us now too far astray from our main present concern, which is with the forces which favor recovery.

I discover in my daily work, that there are many persons going about their regular tasks pretty effectively, and leading fairly gratifying lives, who harbor, nevertheless, some haunting dread of going crazy. If they only knew how many times they have been there already—and come back—it would be logically expectable that they would lose some of the apprehension; but I presume it would still be possible to worry that next time the recovery process might be too slow.

If the view which I have just presented has any large measure of validity, then it must be that the great majority of the human race

are equipped with fairly effective righting-mechanisms, and it would be appropriate to ask some questions: "How did we get that way?" "Whence comes this health potential" and "How can it be cultivated?"

My earlier remarks have, I presume, suggested already the social source of the capacities for regaining emotional balance when upset. I wish to spell this out now more specifically. Life presents many situations which are met satisfactorily in an offhand way, with half a glance, so to speak, but there do come times when a straightforward facing of facts is necessary. Sometimes it is necessary to look honestly and directly at oneself. How would such an ordeal be endurable, with all one's intimate, detailed knowledge of extreme short-comings and shameful faults if one were not supported in some measure by the faith of others?

I submit, in all seriousness, that some form and degree of faith and support from others is a necessary basis for the acquiring of mental health. I say this with a very keen appreciation, at the same time, that there are distressing and crippling perversions of this need. Placative and subservient submission to others, abject conformity and parasitic, dependent adaptation are caricatures, not portraits, of the human need for approval.

The acquiring of sturdy mental health requires the building of sturdy interpersonal supports, with a degree of mutual respect that does not demand subservience. In what ways does a culture favor or hinder this foundation for mental health?

Erick Hamburger Erikson[2], in his penetrating study "Childhood and Society," has said, page 219: "The infant's first social achievement is his willingness to let the mother out of sight without undue anxiety or rage, because she has become an inner certainty as well as an outer predictability." Also page 221: "Mothers, I think, create a sense of trust in their children by that kind of administration which in its quality combines sensitive care of the baby's individual needs and a firm sense of personal trustworthiness within the trusted framework of their culture's life style . . . There are few frustrations which the growing child cannot endure if the frustration leads to the ever-renewed experience of greater (reliability) and stronger continuity of development." And again, page 237: "We must expand our scope to include the study of the way in which societies lighten the inescapable conflicts of childhood with a promise of some security, identity and integrity."

These quotations serve to outline, briefly and succinctly, those basic features of early social experience which enable one, growing up in a given culture, to acquire the healthy and confident assurance of approval in some honorable role and style of life, humanly achievable and gratifying. The expectancies and attitudes, so inculcated and re-enforced by continuing social contacts within the same cultural milieu, provide the basic means for self-righting reactions, serving to maintain or restore mental health.

Let us turn now to a brief consideration of the *imparting* of mental health.

The family has a basic role in imparting mental health. Through innumerable repetitions this proposition has gained almost the status of an axiom, with the corollary that any occurrence of mental illness raises questions about the family, in terms of its cultural adequacy as well as its genetic endowment. The mothers have in recent years in this country been selected for particular blame, almost in a vindictive spirit. If the mothers get the blame for the occasional failure to impart a fully-sufficient measure of mental health to meet the pressing demands of trying times, it is only fair to suggest that the mothers should also be given credit for an extraordinary degree of mental health in the average citizen, if we measure mental health in terms of responsibilities accepted and fulfilled, challenges met with vigor, and readiness to provide support to others less fortunate.

In the more literate portions of our American population there are evidences of self-doubts and mistrust which are not quite consistent with one of the basic conditions for acquiring sturdy mental health, as expressed by Erikson's phrase "within the trusted framework of their culture's life style." The framework is not always trusted, perhaps because for many young families the framework is relatively new. Economic and social mobility continue to maintain a rapidity of cultural change, which had earlier been favored also by immigration and the "melting pot." These rapid changes make it rather difficult for a family "on the make" to feel altogether secure in any settled "life-style." There is some tendency therefore for each generation to distrust its predecessor's value systems, and to react a little stiffly in some opposite direction, imparting thereby to the new crop of children some sense of distrust of the recent past, and self-distrust.

The imparting of mental health becomes thereby in appreciably

larger measure a community enterprise, beyond the boundaries of the family, with an extra accent on "the home town" and the peer group organizations, in compensation, so to speak, for less emphasis on family solidarity.

The choice of school or college is strongly influenced by the need to develop in extra-familial relationships a satisfying sense of group solidarity. The discussion of these processes of developing identity and integrity is hindered somewhat by the negative implications of many of the words that have to be employed. For example, some "gang" experience is often a constructive part of teen-age development, but "gang" is a rather bad word, because the strength gained by adolescents through gang identification may often be employed for unworthy purposes. Membership in certain elite groups may become a powerful support to one's integrity, and thereby a very constructive factor in acquiring positive mental health, but there are unpleasant implications of snobbery, which get entangled in the discussion.

The processes of acquiring mental health cannot be separated out clearly and neatly from the context of living. In the sort of vigorous growing up which leads to vigorous health, there are risks of broken bones, and the building of mental health involves the taking of risks. There is therefore no clear and neat recipe available to one who would inquire how to impart mental health. The building of mental health and the imparting of mental health are not matters to be worked at in isolation but form a part of the context of living. "The acquiring and imparting of mental health" must therefore be viewed as aspects of a culture, rather than as results of a specific technique.

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THE INFLUENCE OF ENVIRONMENT ON MENTAL HEALTH*

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My assignment is to discuss the influence of environment on mental health but I will chiefly talk about the influence of environment on mental illness because I know little about mental health. I am not alone in this respect; modern psychiatry knows a good deal about mental illness but relatively little about mental health. No one has contributed more to knowledge of subtle yet powerful and conflicting environmental forces which influence mental health and illness than Sigmund Freud. It is amazing he not infrequently resorted to an assumption that constitutional forces determined mental and emotional illness or, as he put it in the form of a therapeutic prophecy, "the man with the syringe stands behind the psychoanalyst." Whether this remark, which I consider mostly an expression of a belief, will become verified remains to be seen. Today we have hardly any more evidence for the assumption that constitution primarily determines behavior than we had half a century ago. It has been a hope, a belief, an assumption which to a certain extent has proven heuristically valuable.

One hears statements that the behavior of man and animal is the product of environment and constitution. Such a statement does not even sound erudite; it is trite. Yet many similar statements have been made in our scientific literature. They are probably just as true as the statement that all human beings are mortal but just as meaningless as this statement would be in a discussion of causes of death. The above statement becomes meaningful only if we discover in detail the interaction of organismic and environmental forces. One of my beloved teachers, the great anatomist Julius Tandler, has called constitution

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"somatic fate." However, our ignorance of somatic fate is almost as great as our ignorance of fate. Very rarely are we able to discern in operational detail the inner biological forces with which we are endowed in their interaction with forces of the environment. Such instances are more frequent when we focus on the interaction of the biological aspects of the organism with physical and chemical forces of the environment, such as, for instance, in the study of infection. They are all too rare when we attempt to understand the interaction of constitution with psychological and social forces of the environment which results in a certain type of behavior.

Contributions to knowledge of constitution have been made by global studies of body build, a heredity of disease and of physical and mental traits in the normal person and by many very detailed painstaking studies of neurophysiological and endocrinological mechanisms. There are, beyond any doubt, a few mental diseases which follow Mendelian patterns in which our knowledge is sufficient to predict a certain type of behavior. One example of this type, for instance, is the psychosis accompanying Huntington's chorea but even in the case of this particular psychosis we do not know the necessary and sufficient conditions under which the neurological and psychiatric diseases develop. There is considerable evidence that in some of the functional psychoses, such as in schizophrenia and in the manic-depressive psychoses, some heredity patterns may be discerned. However, our knowledge of heredity in these illnesses is scant, insufficient and controversial in spite of a large literature. Our studies in heredity of human beings in general are extremely difficult on account of the long life of humans, on account of the complexity of the human organism and the human environment, and because the experimental approach which we feel has furnished most data on heredity in plants and animals is not applicable to the human field. Besides that, investigators who have approached this problem too often have definite biases and want on account of their own biases and on account of biases of their culture, to prove or disprove a certain point of view. Yet, I feel the study of human genetics, particularly in the area of major diseases such as schizophrenia and manic-depressive psychosis, is an extremely important field. Like many others, the investigators at Yale in careful studies of schizophrenics have found the occurrence of psychosis in the same family beyond the possibility of chance. Yet, to say with any certainty whether this is due to a genetic

pattern or whether it is due to the interaction of a patient with a psychotic relative is not possible. Probably the study of identical twins who were reared apart and of whom one developed a psychosis while the other did not, may give us more of an answer to these important questions than any other approach. Yet such studies will have to be done in great painstaking detail without any bias and, to my knowledge, so far this has not been done.

One cannot help wondering why so little work is being done in the field of genetics of mental health and illness in our country. Actually only one outstanding investigator in this country, Franz Kallmann, devotes his energy to this field. It is true that a democratic culture is less concerned with innate ability than with what is learned. Even a full knowledge of the genotype will only teach us what the upper and lower limits of the human potential *can be* while the environment will actually determine what *is*, the phenotype. Yet it is to the detriment of our field that such an important area remains relatively unexplored.

A similar statement of caution should be made about stated correlations between body build and human behavior. The notion that persons with a certain body build will behave in a certain fashion is very old and has been expressed, to my knowledge, first by Hippocrates. The scientific proof of such a theory, however, has in spite of the interesting and provocative work done by Kretschmer, Draper, Sheldon and others, hardly been established. Descriptions of body build by these authors have been excellent. The correlation of such body build with the behavior of normal persons or with the characteristics of certain psychotic persons, however, still leaves much to be desired. Of course, this is in large part due to the non-existence of a good theory of human behavior.

Probably the most important contributions to our knowledge of the workings of the biological organism interacting with its environment have come from the great neurophysiological and endocrinological laboratories of modern medicine. I am particularly impressed with some of the recent work in which precise functional ablation of various parts of the brain by fulguration gives rise to definite alterations of behavior. When such behavior is carefully controlled by conditioning and learning, its alterations after such experiments on various animals and recently in human beings in connection with therapeutic operations on the brain have yielded extraordinary information. At times this approach has been used in conjunction with various drugs which have a stimulating or

depressing effect on the brain. One example of this type of behavior is the work of Delgado and MacLean at Yale who, by stimulating the pyriform cortex in unanesthetized monkeys, succeeded in producing very aggressive behavior in response to certain stimuli and, on the other hand, produced marked passivity by stimulating the fornix and cingular gyrus. Another example is work by Bard and later by Schreiner. Schreiner succeeded by removal of the nucleus amygdalae in causing profound character changes, such as change in sexual desires, or, most impressive, the change of a puma, one of the few animals which circus people cannot train on account of its ferocity, into a mild and tame animal. As Franz Alexander once remarked, only detailed studies of definite physiological functions and anatomical structures will replace the vague and global notions of constitution with a specific operational and meaningful content.

To review or even to approximate essential factors of the influence of environment on behavior is impossible in such a lecture. I would like, therefore, to turn briefly to methods which have been used to approach this topic. In their erudite book on *Behavior Pathology*, Cameron and Magaret list four approaches: The clinical or case study approach, the statistical approach, the cross-cultural approach, and finally the experimental approach. The approach through case history is the proper province of the clinician. Beyond any doubt most of our knowledge in clinical psychiatry is based on this approach. This approach is particularly rewarding if phenomena are not only described but understood in terms of conflicting forces, some of them being experienced by the individual consciously, and most of them, including the most powerful ones, unconsciously. To discern these forces has been, both from a therapeutic and scientific viewpoint, the task and great contribution of psychoanalysis and psychodynamic psychiatry. To do this by reconstruction, as practiced in psychoanalytic therapy of adults, is, as any analyst knows too well, a very difficult task. Postdiction in behavioral science is as difficult as prediction. It is astounding, then, that direct observations of children and infants have borne out the basic theories of psychoanalysis and even permitted carrying on such observations with a deeper understanding. From the viewpoint of understanding the impact of environmental forces on infants and children such direct observation imbedded in the heuristically valuable theoretical framework of psychoanalysis as, for instance, in the work of Escalona, Anna Freud, Spitz,

Katherine Wolf, and others, is of the greatest importance to the understanding of human behavior. Both from the theoretical viewpoint and from the practical viewpoint of modifying human behavior, such studies in early childhood and in infancy can hardly be overestimated in their value. It is in this early period of human life when one can observe modifications of the crude and primitive urges of sex, aggression and dependency of the child by social and emotional attitudes of parents. This is the time when, although verbal and subjective reports may not be obtained, events are less obscured by the complex history of many unknown variables. The clinical approach so far has been the royal road to knowledge of human behavior and compared with it, the other approaches are byways.

The statistical approach in the field of psychiatry, though extensively used in epidemiological explorations of mental health and illness, is essentially alien to the psychiatrist's thinking. Only in the very recent past, when interdisciplinary research between psychiatrists and behavioral scientists and epidemiologists has been developing, have statistical data on mental health and disease been collected. I once pointed out that we have no statistical data on normal and abnormal behavior. There are very few areas in human behavior in which we have such data. Exception to this is data on admissions to mental hospitals, the scattered and very incomplete data on incidence of mental illness in the general population which were critically reviewed by Lemkau, Tietze and Cooper, data on distribution of intelligence, data on social economic behavior, and last but not least the monumental work of Kinsey and his associates on sexual behavior. Certainly no one has demonstrated more clearly the great variability of learned human behavior in contrast to the relative uniformity of biologically determined phenomena than Kinsey. It is extremely important in my opinion to gather such data. Psychiatry should be deeply indebted to those who are undertaking such a task and even to those who do not always follow the usually well-meant advice that psychiatrists in general readily offer to other scientists working in our field. These days one does not exactly gain in popularity in psychiatry when one defends Kinsey, but in my humble opinion, Kinsey and his associates have crossed an ocean and, although some of us thought they knew of the existence of the new continents yonder, such a first crossing cannot be made at a great depth but on the surface. It will be up to future investigators to fuse data furnished by depth psychology

and a taxonomic approach. In years to come, and maybe in the next generation of scientists, we may be fortunate enough to find men who can do this either singlehanded or through a collaborative approach.

An approach which utilizes both statistical and depth psychological methods is the cross-cultural approach to mental illness and health. Since Freud wrote "Totem and Taboo" and Kraepelin explored mental illness in Malaya, many psychiatrists and anthropologists such as Erikson, Moloney, Leighton, Linton, Malinowski, Stainbrook and others have attempted to correlate basic cultural patterns with mental illness. Based on our clinical experience and on current well established theory that a relationship between child rearing and infantile neurosis on one hand and adult maladjustment exists, cross-cultural explorations of child rearing and of adult maladjustment should yield important empirical data and theoretical concepts. If cultural differences in child rearing are marked, adult maladjustment might be expected to differ. So far these theses have never been carefully or extensively tested. We are lacking good data on child rearing and certainly we do not possess good epidemiological data in mental illness in any culture. We have no exhaustive or intensive study of our main cross-cultural hypotheses. Comparative studies would have to be done in extremely different, though equally complex cultures because conditions of survival of the mentally ill in complex and primitive cultures would be too different. In a recent visit to Japan, Korea and Okinawa, I was impressed with the possibilities of such cross-cultural comparison between the high cultures of the Far East and our own. On first and superficial inspection it would seem that schizophrenia and manic-depressive psychoses are quite similar in Oriental and Occidental cultures, while neurotic patterns differ widely, but much work will have to be done before sound, definite statements can be made. Possibly, because such an undertaking is difficult and costly, a comparison of mental illness in the different social strata of our own culture should be carried out at home first. Hollingshead, Myers, Roberts, and Redlich have been engaged in this task for the past three years and are gathering evidence about differences in mental illness in the different classes. One might consider our work an extension of the fundamental work by Faris and Dunham on ecology and mental disorders. We do not know what the actual incidence of neurosis in our society and its different strata is. There are, however, many more neurotics in the upper and middle classes in treatment with psychiatrists

than in the lower classes. There is an increasing awareness of the existence of neurosis in the upper and middle classes which induces the neurotics of such groups to seek psychiatric treatment which is not the case in the lower classes. In the lower classes it seems that neuroses are often more severe and gross somatizations of neurotic conflict are more frequent, while in the upper classes we find a larger proportion of character neuroses. Actually this was expressed in a casual way by Freud when he referred to a comedy by the Viennese playwright, Nestroy, "First and Second Floor." On the first floor the janitor's daughter lives a rather lusty life and is emotionally healthy while on the second floor the landlord's daughter fades away neurotically in a frustrating platonic romance. The differences in psychoses of all types are less marked, although there is some tentative evidence that the hardships of lower class living promote the occurrence of schizophrenia. This certainly would prove the importance of social environment for the etiology of mental illness. However, we know only little about the stresses which contribute to such illness or when they reach the point under which people will break. We must keep in mind, too, that psychiatry has paid relatively little attention to the social environment and concentrated more on the exploration of organic and intrapersonal factors. One might say we behave like astronomers who explain a solar system, pay attention to the sun and the closest planets but neglect the outer universe. Whether exploration of the outer universe will yield important results remains to be seen—but it will have to be done. A great deal more work in this field is needed and should yield rich results. I will come back to some aspects of the Yale study later.

The experimental method, which has been invaluable in certain basic sciences including animal psychology, it seems, has contributed least to the advancement of our knowledge about the influence of the environment on mental health and illness. Such a statement certainly must not be interpreted as final; promising work by Hebb and others is being carried on. At this time, however, most experimental conditions cannot approximate the complex and subtle constellations under which normal or abnormal behavior will ensue. One condition of good experimentation is adequate control. In experiments with neurotic patients certainly it has been just about impossible to find what an adequate control subject would be. Techniques, such as hypnosis and narcoanalysis, have been utilized in experiments by Brennan and Gill, Erickson, Kubie, and others

to imitate complex life-like situations with moderate amount of success. We must not forget, however, that in producing symptoms, conflicts, defenses, dreams, etc., such a technique raises an unknown and complex variable by its very introduction. An important exception in which an experimental approach is approximated is the discriminative use of projective techniques eliciting responses to certain environmental stimuli such as pictures in the Thematic Apperception Test or ink blots in the Rorschach Test. Some of these stimuli are far removed from the ordinary stimuli of life. Attempts to produce more life-like experimental situations have been developed with some success by H. A. Murray and his associates in their work at the Office of Strategic Services and at Harvard. As it seems so difficult to create experimental situations which approximate life, one might profitably give more thought to using life-like situations as they occur and predict behavior based on empirical data, based on hypotheses occurring after such stimuli. Such situations might be situations of severe stress such as occur under artillery shelling, dangerous plane rides, catastrophies such as the Cocoanut Grove fire described by Lindemann, or they might be harmless situations such as, for instance, waiting in the office of a physician before a consultation or before a minor operation. In literature Thornton Wilder in his magnificent book *The Bridge of San Luis Rey* used this approach. If the variables of the past history are sufficiently known and the meaning of the event is clear, relatively precise predictions should be possible; of course, the crux of the matter is that the meaning of any such situations to different persons remains obscure until very detailed data, such as we obtain only by the psychoanalytic method, are available.

The closer we are able to use environmental stimuli of everyday life, the more we can hope to approximate life-like conditions by experiment. Recently, Redlich, Levine and Sohler, and Laffal have developed a technique at Yale which uses humorous stimuli, such as cartoons, to invoke verbal behavior or fantasy behavior from patients. However, most of these techniques, although valuable in the hands of a few gifted experts, are neither reliable nor valid to the degree that precise predictions of behavior patterns can be made. A different experimental approach, which ultimately will be most valuable, is the neurophysiological approach of which I cited an example before.

So far, by reviewing our state of knowledge in the controversy of nature versus nurture, and by scrutinizing contributions of method, we

have focused mostly on descriptive and dynamic diagnosis and etiology. In discussing the influence of environment on mental health, one could easily devote this lecture or a series of lectures to the problem of treatment. Treatment, whether organic or psychological, may be understood as an attempt to expose the patient to a certain type of environment in which the therapist and the patient, to use Parsons' terms, are the main actors. I will reflect only on a few limited aspects of this problem. We definitely know today that success in therapy does not solely depend on the interaction of therapist and patient alone. John Dollard, paraphrasing Kardiner, once remarked that patients don't get well on the couch but in life. There are conditions in life which will prevent any sort of treatment. Insight is a prerequisite to cure, but insight alone does not cure; it has to be applied. To know more precisely under what environmental conditions insight will help is an important problem of dynamic psychotherapy.

In another phase of this problem, in recent works on the social structure of hospitals by Stanton and Schwartz, Caudill, Szurek, Maxwell Jones and others, the importance of the milieu, the importance of the interaction between personnel other than the therapists and patients, and finally between patients among each other in the hospital setting was clearly demonstrated. Knowledge of this particular environment will contribute materially to a better practice and theory of therapy. Going even further than this, we have collected interesting data at Yale on the importance of community and family and the rehabilitation of psychiatric patients. Studying the recovery of lobotomized patients, Brody, Rosvold, Jenny Mohr and Redlich could clearly establish that the success of the operation to a large extent depended on the readiness and ability of the patient's family to reabsorb the patient into the family or into the community's orbit. Lindemann expressed similar ideas and relevant observations were made in the Yale project on Social Structure and Psychiatric Disorders. We were strongly impressed with the fact that lower class patients tend to become chronic inmates in mental hospitals because the lower class family neither can nor wishes to provide for them the setting which permits rehabilitation. This, in our opinion, is the principal reason that the relative number of chronic schizophrenics of the lower classes is thirty times higher than chronic schizophrenics of the middle and upper classes. The fundamental importance of the environment for psychiatric treatment has been com-

mon knowledge of child psychiatrists for a long time.

There is one other aspect in which the environmental factor in treatment is crucial. This concerns the availability of psychiatric treatment itself. In our opinion, based again on data collected by Hollingshead, Robinson, Redlich and Myers, treatment is a function of its cultural environment. We were clearly able to establish the existence of different psychiatric treatment patterns for the upper classes and for the lower classes. Upper and middle class schizophrenics are more likely to receive intensive psychotherapy and a smaller share of organic treatment than comparable lower class schizophrenics. Referrals of schizophrenic patients to psychiatry differ according to their social class position. The upper class schizophrenic is referred through medical channels while the lower class schizophrenic is usually committed through legal channels such as police stations and courts of probate. In psychoneurotics most psychoanalytic treatment and most psychodynamic therapy is administered to patients of the upper and middle classes while the lower class psychoneurotic receives little insight therapy and a comparatively larger share of supportive and manipulative psychotherapy. I once paraphrased this by saying that the lower class patients often land on prison or hospital cots while the upper class patients are placed on analytic couches. The fact that a few child psychiatric clinics in some metropolitan areas administer the best type of treatment to patients without any regard to their class position is an exception to such a social differentiation.

Careful analysis has demonstrated that reasons for such differential treatment of the lower classes are not just economically determined but are due to lack of communication and due to differences in cultural values between the middle class psychiatrist and the lower class patient. In an interesting study of our Psychiatric Dispensary, Schaffer and Myers demonstrated that psychoneurotic patients of equal economic status but of unequal social status receive very different treatment. Middle class patients receive insight therapy, lower class patients supportive therapy. The treatment of middle class patients is less likely to be terminated prematurely than that of the lower class patients. A neat sidelight was thrown on the state of affairs when we found that upper middle class patients were usually treated by senior staff, lower middle class patients by residents, and lower class patients by medical students. Needless to say, this was certainly not a deliberate policy and

came as a considerable shock to us.

On an even larger scale we notice such differences between patterns of psychiatric practice in countries with different cultures. The increasing number of neurotics treated by psychotherapy in the U. S. compared with a low number of such patients in most European countries or in the Far East is not a consequence of our culture. It is due to the interest of the upper and middle classes in our culture in a therapy which by understanding and facing the hidden neurotic difficulties and conflicts of the past, particularly of childhood, overcomes current problems and permits optimal function of the person. Ruesch and Bateson, R. Lidz and T. Lidz, as well as Knoepfel and Redlich stated that the strong American emphasis on dynamic insight therapy and psychoanalytic theory is not incidental but has its root in our culture. I will only briefly refer to some aspects of this. Our culture underwrites the democratic idea of equal opportunity for men and a liberal individualism which is concerned that everybody realize his greatest potential with a high premium on adjustment. Such an attitude fosters psychotherapy, overcoming personal maladjustment.

Anxiety and guilt in our society may be expressed more freely than in most other societies; such an attitude fosters a cathartic method. As guilt, particularly over sexual behavior in a society with a puritanic tradition, is strong and troublesome, dissolution of such guilt from the society's viewpoint is desirable. Finally a society with a highly developed technology will underwrite a rational type of psychotherapy, to replace unreason by reason or, as Freud put it, where the id was, the ego shall be. These attitudes create a favorable soil for therapy which basically tries to give insight and uncovers early mistakes in child rearing as well as current irrational behavior, permitting correction of such maladjustment. Thus environment not only largely determines mental health and illness but it influences forms of therapy too.

Psychiatric therapy will develop when the public understands its principles and demands its services. Education of the public and creation of a favorable and receptive attitude is an important function of psychiatry. Let us remember that we should be teachers of a medical specialty and its basic sciences and not crusaders. Actually, we have not done badly: Remember the many books, pamphlets, films, comic strips and cartoons (Redlich) in which psychiatry is portrayed. Some of these books, such as Spock's masterwork on the care of infants and

children, have an enormous sale. Another expression of the spread of psychiatry is the existence of the world-wide mental health movement and the opportunities provided by the Mental Health Act in the United States and by similar legislation in Great Britain. If the culture does not supply a proper setting and if public education is not possible, psychotherapy will hardly spread; certainly this was my impression when I observed the first beginnings of a psychotherapeutic orientation amongst the psychiatrists of Japan and Korea.

Dynamic psychiatrists, however, have gained deep insight about prevention and have contributed a great deal to current knowledge in the field of child rearing and education. In a recent address to the United Nations, Anna Freud, based on her wartime experiences with evacuated British children, recommends certain applications from her own field which may ultimately lead to noticeable alterations in the attitudes of the next generation. To do this, she advocates enlisting in every country the services of at least one capable and experienced child analyst to teach a practicable and applicable child psychology in newly set-up and especially equipped and endowed children's homes and orphanages. A program of this sort, Anna Freud feels, if carried over a sufficiently long period of time, might well have revolutionizing consequences in the upbringing and consequently in the attitudes of future generations of children, which is the hope not only of modern psychiatry but of modern man.

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FELLOWS' PORTRAITS

It may not be generally known to Fellows of the Academy that the Library has an outstanding collection of medical portraits: some 10,200 separate ones mounted and about 139,300 catalogued in books and journals. It goes without saying that a picture of every Academy Fellow ought to be found here, and Fellows are invited to send the Library their photographs, if one is not already on file. Any size is acceptable, from the vest-pocket or cabinet photograph up; what is desirable is that it be a good likeness. Further, pictures of any other physicians for which Fellows wish to find a repository will be a welcome addition to the Library's collection.

SYMPOSIUM ON THE CULTURAL NEEDS OF MEDICINE AS VIEWED BY SENIOR MEDICAL STUDENTS*

The Place of Medical History in New York Medical Schools

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WEBSTER'S DICTIONARY defines "culture" as "The trait complex manifested by a tribe or separate unit of mankind." This definition affords me the opportunity to limit my discussion to that separate unit of mankind, the medical school, and examine the trait complex involving medical history in that tribe.

First a backward glance. Teaching medical history in the United States medical schools is hardly a recent development. At the suggestion of Thomas Jefferson, Robley Dunglison began teaching medical history at the University of Virginia. John Shaw Billings presented lectures at Johns Hopkins as early as 1877, and as lecturer in History and Literature of Medicine continued until 1905. Roswell Park, meanwhile, began instruction in medical history at the University of Buffalo in 1897. Two philosophies of instruction in medical history are typified in Sir William Osler, who advocated bedside instruction built into clinical presentation, and Cordell, who favored separate systematic courses for all students. The Institute at Johns Hopkins, for the advancement of teaching, discipline and research in the history of medicine, the William Welch Library, the magnificent stimulus of Henry Sigerist after 1932, the establishment of full-time professorships in medical history at Wisconsin and Yale Universities, all represent a few islands of excellence in instruction in the history of medicine in this country.

In our candid moments, we should admit that New York medical schools do not represent such islands of excellence—this in spite of the fact that many of the New York schools have taken the lead in urging

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premedical students to take courses in the humanities, arts and letters as a broad humanistic base for the study of medicine. The forthcoming report of Dean Aura Severinghaus' Sub-committee on Premedical Education is very specific in urging the soundest cultural grounding for those coming into medical school. Yet the humanistic side, the cultural and historical phases of medicine itself, are grossly neglected in the curricula of these same medical schools.

The Library of The New York Academy of Medicine is an outstanding storehouse of the documents of medical culture and history, one that other centers of research and instruction in medical history might well envy. Several medical schools also have large collections of historical materials of great teaching value, largely neglected. And yet there were a large number of enthusiastic students of the history of medicine who participated in The New York Academy of Medicine Institute on the History of Medicine at Arden House two months ago, and many of them have assembled here tonight.

How is historical and cultural medicine being taught in New York City medical schools? First, there are no courses in historical or cultural medicine, although recently a course entitled "Trends in Medicine," taught by visiting experts, was tried at New York Medical College. Secondly, from time to time, devoted students of history of medicine have offered extracurricular courses on their own time and initiative. Prof. Adolph Elwyn's course at The College of Physicians and Surgeons three years ago was an example. Such courses depend on the year to year availability of the lecturer's time, of available begged lecture halls, and students' "free" time. Such stopgaps then are not a substitute for consistent year to year instruction, though they represent the only systematic presentation of the great ideas and epochs of our medical past now available to our students.

Thirdly, the Oslerian tradition is kept alive by occasional lecturers who present their subjects in the full glory of their historical context. Dr. Loeb's lectures on diabetes, Dr. Barr's lectures, and the medical lectures under the direction of Dr. Perrin Long have this emphasis and do it well. But such Oslerians are rare. Many departments lack them completely and either do not try to present the background of their subject or do it poorly.

Fourthly, several schools have student medical history clubs. With the exception of New York University's hardy William Welch Society,

these have had a notoriously tenuous existence. Our medical history society at P. & S. passed into oblivion four years ago when the seniors, having failed to recruit the classes behind them, graduated and were gone. Such groups, though sporadic, indicate a latent interest in learning about medical history.

These considerations lead to the conclusion that the teaching of medical history in New York today is quantitatively small and qualitatively uneven. There are no systematic courses in the curriculum, the Oslerian fabric has many gaps, the medical history clubs are constantly threatened with death by graduation, and partisans of medical history who would like to give spare-time courses often cannot do so. The net result is a chronic deficiency state in the knowledge of graduating medical students. It is no wonder that there is no younger generation of medical historians in the ranks of recent graduates. It should surprise no one that the majority of those taking the Hippocratic Oath next month will not know the significance of Hippocrates and the Greek era in medicine.

How are we to rationalize this deficiency? Is the fault with the student, the teacher, the overcrowded curriculum?

In spite of great demands on his time, the student is interested in medical history, and is willing to devote time to it if it is presented in a worth-while manner. Student interest crops up in the student history clubs, in participation of majorities of classes in elective medical history courses when offered. Students may even take the initiative requesting courses in medical history. Just this spring, 60 per cent of the P. & S. first year class petitioned our dean for repetition of Prof. Elwyn's spare-time course. Prof. Elwyn's curricular work load forced him to decline this invitation. Fortunately Dr. George Rosen, doing full-time work in Public Health, but an ardent and able medical historian and excellent teacher, was induced to give six one-hour lectures to orient the class in medical history and stimulate their further interest. Attendance grew as the series progressed. The class agreed unanimously that such an introduction should be offered to every class during the first year. Of course, if medical history is presented without the spark of good teaching, as disjointed meaningless anecdote, colorless fact, dates and names without significance, student interest will be small.

The problem of the teacher of medical history is knotty indeed. Dr. Ackerknecht, formerly of New York, now Professor of History of Medicine at the University of Wisconsin and a magnificent teacher,

warns that a bad teacher with a good program will not succeed, while a good teacher with a bad program will do a good job. Medical history requires a good teacher. He should know his history, present ideas as well as facts, stimulate thought, make the past come to life and shed meaning on the present. There are a number of such excellent teachers in New York, but the qualities which make them ideal as teachers of medical history put them in great demand for other work. Often their enthusiasm for medical history makes them willing to teach on an extra-curricular basis. That we have a hard core of such teachers in New York is our very good fortune.

The overloaded curriculum is a real problem. Yet there are often some available school-day hours or other time not currently used to best advantage in which an introductory survey in the history of medicine could be given. At P. & S. this spring we were fortunate in finding an hour from 12 to 1 when our first year class was free. If there is room in the curriculum for correlation clinics to prepare students for clinical work ahead, there should also be room for correlation clinics in cultural medicine to relate course material to its historic context.

The problems of the student, the teacher and the curriculum are challenging but not insurmountable. Student interest is already present and will be further stimulated by an introductory historical orientation; we are fortunate in having a number of excellent teachers of medical history in New York, though they are too few and too busy; the curriculum is crowded but room can and should be made for an introductory course in medical history.

In summary, I believe that medical history belongs in the curriculum of every medical school conscientiously seeking to produce the humanistic as well as the scientific physician. New York possesses great resources for such teaching but is using only a small fraction of them. I might suggest the following as an irreducible minimum of teaching in medical history in medical school.

1. An introductory, orienting survey course of at least six hours, offered to all students, taught by a good teacher, aiming to set the historical and philosophical background, to orient medicine in society, to provide a framework for the understanding of medicine as a whole, and to open the students' eyes to medical culture and history. This should be a first or second year course.

2. An upper class forum, seminar or club in or outside of class hours

offering further opportunity for historical study, discussion and research.

3. Revitalization of the Oslerian method of integration of historical and cultural material with clinical and pre-clinical teaching. To fill the gaps, many departments and teachers would need the help of an historian who could brief them in background material, or who could present the related background material for them.

4. A part- or full-time faculty post for the person who will supervise the introductory course, advise the seminar groups, help fellow faculty members revitalize the Oslerian method, and also bring out the dusty Vesalius and encourage historical research.

These irreducible minima would give medical history the place it deserves in our teaching, and would afford the student the humanistic understanding of his work and profession to which he is entitled.

The cultural needs of medicine today are enormous and in many cases not clearly defined. History of medicine in medical education is a need that is clear. Paraphrasing Osler's advice to students, let us tend to these things immediately at hand. We have the resources, the teachers, the interest of students. We can make New York an island of excellence in the teaching of medical history. This is our challenge and opportunity.

Samuel A. Mudd, M.D.

JOHN U. GARDNER

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FIVE days before his death in a burning barn in Port Royal, Virginia, the hounded John Wilkes Booth, assassin of President Lincoln, wrote in his pocket diary, as follows: "For doing what Brutus was honored for—what made Tell a hero—and yet I, for striking down a greater tyrant than they ever knew, am looked upon as a common cut-throat."[1] These are the words of the man who a scant seven days before had mortally wounded the President in his box at Ford's Theater in Washington, D.C.,

jumped to the stage, dashed through the stage door, and fled the city on horseback.

In the eighteen hours which followed, he brushed the lives of a dozen people, among them Samuel A. Mudd, a country physician who lived some thirty miles southeast of Washington. For the part he played in Booth's attempted escape, he was branded a conspirator and a member of the band of assassins. In six weeks, his family was reduced to poverty, his practice and reputation swept away, and he was sentenced to imprisonment, at hard labor, for the remainder of his life.

Samuel A. Mudd was born in 1833, the son of a wealthy planter and slave-owner, in Charles County, Maryland. He was educated at St. John's College in Frederick, Maryland; Georgetown College in Washington; and was graduated from the University of Maryland Medical School in 1856. The next year he married and established his residence on a 500-acre farm near Bryantown, Maryland.

Dr. Mudd admittedly had met Booth on business on two previous occasions: The first was in November, 1864, at Bryantown, when Booth spent the night in Mudd's home; the second was the following month. On both occasions, Booth was said to be inquiring about land and the sale of some horses; but it was later claimed that he was planning his escape and was enlisting the aid of Dr. Mudd. Mudd also had the acquaintance of John H. Surratt, another accomplice, whose mother had operated an inn half-way to the capital from Bryantown. These two contacts were to be the undoing of Dr. Mudd.

At 10:30 p.m., April 14, 1865, Booth shot Lincoln and suffered a Pott's fracture of the left fibula on escaping. He rode off with David Herold, one of his followers, reaching Dr. Mudd's house at four in the morning, seeking medical aid. According to the sworn statements of the Mudd family, Booth was disguised in false whiskers, wore a shawl over his head, gave a false name, and spoke very little. Dr. Mudd set the fracture and was paid $25. Booth remained in a room in the doctor's house and left at four that afternoon.

In the meantime, the doctor had gone into town and had heard about the murder, but on his return the two men had left. The Mudds thought the actions of the two strangers had been suspicious and agreed to notify the authorities. However, they made the fatal mistake of waiting until Sunday when they customarily drove to Bryantown for church services. Immediate investigation followed, and the riding boot which Dr. Mudd

had removed from the stranger's leg was identified as Booth's. The result was that just one week later the terrified Mudd was taken into custody and away from his home for nearly four years, charged with being part of the band that had murdered the President and that had made attempts on the lives of other government officials the same night.

A wave of bitterness swept over the Northern states, and high government officials placed the responsibility for the murder on the Southern people. This monstrous idea soon found voice in a cry for revenge, and who were more suitable objects than those who had been connected in any degree with the plot? This included Dr. Mudd. Vindictiveness was carried far. In a sworn statement, Mrs. Mudd declared that the United States soldiers sent to patrol her house before Booth's capture "burned the fences, destroyed the wheat and tobacco crops, pulled the boards off the corn-house" and scattered it, broke open the meat house and took all the meat.[2]

The trial of the accused lasted from May 10 to June 30, with a military commission serving as a court. General Thomas Ewing was Dr. Mudd's lawyer. Despite a brilliant defense, Dr. Mudd's known Southern sympathy, the fact of his having met Booth only six months before, preconceived opinions as to his guilt, and the testimony of false witnesses eager for shares of the $100,000 reward, led to Mudd's conviction. General Lew Wallace, who sat on the court and was yet to write *Ben Hur*, is quoted as having said: "The deed is done—somebody must suffer for it, and he may as well suffer as anybody else."[3]

Dr. Mudd was sent to Fort Jefferson in the Dry Tortugas off the coast of Florida in the Gulf of Mexico. He was at first subjected to the harshest discipline, being placed in irons, put at hard labor, and incarcerated in one of the dungeons. He attempted escape in September, 1865, but was apprehended and his punishment increased in severity. Two years after the beginning of his imprisonment, an epidemic of yellow fever broke out in the fort and raged for a period of months. With the death of the commanding officer, the fort physician, and most of the officers, Dr. Mudd was called upon to assist in the treatment of the sick. For twenty-seven days he had freedom of the fort and could have escaped had he so desired. Instead, he took charge of the epidemic and checked its spread by "shutting off the hospital and barracks from the windward side to keep out the humors from the moat."[4] Although he did not realize it, he was actually keeping out the mosquitoes which

thrived in the moat partially surrounding the fort. He himself contracted the disease. The garrison was greatly appreciative of his efforts in their behalf and prepared a petition for his release. This never reached President Johnson, and instead of receiving gratitude for his services, he was again placed in chains and at hard labor.

During the period of his imprisonment, unremitting attempts were made by his wife and friends to effect his release. This was finally accomplished in February of 1869, when President Johnson, only a few weeks before the expiration of his term of office, signed an official pardon and handed it to Mrs. Mudd, saying: "I have complied with my promise to release your husband before I left the White House."[5]

Dr. Mudd was released and returned to his home to start his practice again and rebuild his farm which had been idle since his trial. He died thirteen years later, at the age of 49, never having fully regained his health or practice.

* * * * *

The story of Dr. Mudd fits into the history of medicine in giving us a picture of a physician one hundred years ago in America. It goes further than this, however. It touches on the history of law, the history of penal systems; it is a chapter in American history.

One may well ask: "Where is the utility here? This certainly isn't the story of a great success, a great scientist. It doesn't make me a better clinician." This is the sort of question that might be put to me by those who seek specific knowledge in clinical or experimental fields. There are, however, other values which may not be as evident, but which are as important in the training of a well-rounded physician. I want to know what physicians in the past *thought* and *did* and *how they lived* in terms of their total environment. I want to know the role they played in their communities, not only as physicians, but as citizens. This to me is the value of knowing Dr. Mudd; this is what I look for in the history of medicine.

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On the Cultural Needs of Medicine as Viewed by Senior Medical Students

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LET us step backward sixty years for a glance at the intellectual climate of the time. This was the day when science and the scientific method were beginning to dominate intellectual thought. The effect of this emphasis on science was revolutionary and at the same time narrowing. The scientist was preoccupied with his experiments, to the neglect of the humanities and their liberalizing influence. Time for the study of history, or the classics of an older world, was at a premium, there were too many new worlds to behold in a test tube. As a result, the teaching of medical history disappeared from the universities, and the universities themselves became conglomerations of professional and technical schools.

The bacteriologist Emil Behring, in an essay written in 1893, betrayed the effect that this emphasis on science had on the physician's concept of his role in society. He cited a report by Rudolph Virchow on a typhus epidemic, in which Virchow dealt with social and economic factors as they related to disease. Behring commented that the therapy of infectious disease did not have to be sidetracked by social considerations or reflections on social policy.

Today, we have grown to accept Virchow's conclusion as he stated it one hundred years ago: "Medicine is a social science." The scientific method and discoveries are not to be minimized; without them we would be helpless against the ravages of disease. But the broad aims of medicine deal with the individual, and with the society of which he is a part. To prevent disease in society, and to aid in the readjustment of the patient to society, are among its primary goals.

In the light of this modern concept of medicine, one thing is apparent: a major cultural need of the physician is the appreciation of the reciprocal influences that medicine and society have upon one another. Such an understanding leads to the development of a social and moral

responsibility consonant with the highest regard for human values.

The physician needs a knowledge of medical history, sociology and economics in order to appreciate certain developments within medicine itself. The first of these developments is the concept of social medicine. Here, the sociologist and anthropologist are as important as the doctor in determining policy. The conceptual tools include an understanding of society in terms of social groups, and the different health problems which these groups face. The second development is the concept of rehabilitation, a field which has grown greatly during the past ten years. Rehabilitation sees the individual as cured not when his illness has been conquered, but only when he is returned to society as a functioning member, within the limit of his capabilities. This is the highest type of social responsibility and the physician must be equipped to discharge his duties in this sphere intelligently and effectively.

There are other reasons why the physician would be an incomplete man if he did not understand the social and economic currents of his time. It is important for him to have this knowledge in his capacity as a citizen, for with his training as a physician he is uniquely qualified for social leadership. Doctor Howard Taylor pointed out these qualifications in a symposium here at the Academy of Medicine in 1947: "No man is perhaps better equipped to transmute the new discoveries of science into manageable human values. Medical effort, almost alone in the midst of a world of conflicting ideas, has been consistently directed toward the goal of human welfare. Membership in such a program should qualify a man or woman to hold opinions and provide leadership toward the solution of the world's tragic social difficulties."[1]

How can this understanding of medicine as a social science be gained? How can social responsibility and a humanistic approach be developed in the young physician?

It is my contention that the study of medical history, and the development of an historical approach to medical problems, can do much to achieve these ends.

History itself is a social science, and it is therefore particularly adapted to the study of medicine's role in society. Furthermore, there has been a trend among historians during the past quarter of a century to emphasize social and intellectual developments. The general historian has included the main trends in medical history as part of the history of world culture. The medical historian, in turn, has begun to probe the

developments in sociology, economics, and philosophy, as they affect medical practice.

This widening of horizons in medical history has come at an opportune time. Today, when the physician is asked to assume leadership in the formulation of policies of national health, the historian stands ready to aid him. There is a tendency among the public, and among many physicians, to regard the development of a social conscience in the physician as something imposed from the outside; that is, they picture the medical profession as succumbing to the pressures of the general citizenry and finally realizing the broad social aspects of medicine. Yet even a superficial knowledge of medical history would reveal that since the early nineteenth century the idea of medicine as a social science has had a long and noble development within the ranks of medicine itself.

During their college days, premedical students are taught how industrialization leads to new ideas of social welfare and legislation. As medical students, somewhere in the course of their four years of study, future doctors should be taught how the Industrial Revolution led to new considerations of social medicine. This knowledge would give a new awareness to the medical student and physician of the traditions within his own profession to which he may turn for guidance in the understanding of medicine's role in society.

Medical history is especially important in an age of specialization. Because of its broad viewpoint, it serves to break down the barriers separating medical specialties, and it presents the totality of medical thought to the physician. Medical history bridges the gap between the humanities and science. It brings us to the mature judgment pronounced by the surgeon John Hunter two centuries ago: "Nothing in Nature stands alone; every art and science has a relation to some other art and science, and it requires a knowledge of these others . . . to enable us to become perfect in that which engages our particular attention."[2]

The importance of uniting science and the humanities may be viewed in another way. There is a disturbing cleavage between the scientist and the social thinker, between the men who make the new discoveries, and those who try to understand their meaning for society. George Sarton has suggested that these two groups might meet and derive mutual benefit from their common interest in the history of science. This would apply equally to the medical profession—for medicine stands as a

colossus straddling the sciences, on one side, and the broad problems of human welfare on the other. The public health administrator and the laboratory investigator in the medical sciences can meet on the common ground of history and realize the profound unity existing between them. Theirs is the search for truth and its application to human betterment. In such a setting, the ends will always dominate the means, and vision will always transcend technique.

In summary, there is a need in medicine for men of social responsibility who practice their profession with the highest regard for human values. Such men are the humanistic physicians who have brought honor and respect to our profession throughout the ages. Teaching medical history can aid in the training of these men, for medical history represents the humanities as they affect medicine or are affected by it.

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Medical History in Medical Education

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I WISH to thank the Section on Historical and Cultural Medicine for granting me the great honor of inviting me to speak here tonight. I have attended your sessions here as well as the medical history meetings in the Rare Book Room whenever I have been able to steal the time, and have always found them most rewarding. I hope that I will not return evil for good tonight.

I find that the other speakers, Mr. Wright particularly, have brought out many ideas and made suggestions which are similar to mine; I think

this repetition is good, for working independently we seem to have come to the same conclusions concerning the value and importance of the history of medicine.

My interest in the history of medicine began coincidentally with my interest in medicine as a profession, and perhaps the former led to the latter. I consider myself fortunate because I enjoy learning about the past of my profession. If I cannot know Hunter personally, through history I can still appreciate the ferocious energy and inquisitiveness which characterized this Shakespeare of medicine, and thereby gain inspiration and courage for my work of today.

Our knowledge of the past is our only key to what the future may bring, and the reader of medical history is struck by the continuing relationship of medicine to all other aspects of social life, past and present. We turn to the past in order to understand the institutions, practices, and accomplishments of the profession of today and tomorrow, and I believe that the medical student who remains ignorant of historical trends cannot fulfill the awful obligations which are imposed upon the physician of today. Oliver Wendell Holmes, speaking to a graduating class at Bellevue in 1861, urged his listeners to recognize this truth:

"There are, of course, in every calling, those who go about the work of the day before them, doing it according to the rule of their craft, and asking no questions of the past or future, or of the aim and end to which their special labor is contributing. These often consider and call themselves 'practical men.' They pull the oars of society, and have no leisure to watch the currents running this or that way; let theorists and philosophers attend to them. In the meantime, however, these currents are carrying the practical men too, and all their work may be thrown away, and worse than thrown away, if they do not take knowledge of them. . . . It is not only going backward that the plain workman is liable to, if he will not look up and look around; he may go forward to ends he little dreams of. . . . And so, with subtler tools than trowels or axes, the statesman who works in policy without principle, the theologian who works in forms without a soul, the physician who, calling himself a practical man, refuses to recognize the larger laws which govern his changing practice, may all find that they have been building truth into the wall, and hanging humanity upon the cross."

In spite, however, of the seeming necessity to learn the larger laws, there is little interest in medical history, and what interest does exist is

mostly in the diverting aspects of the history of medicine—Hunter inoculating himself with syphilis, and Withering paying an old hag for a brew reputed to cure the dropsy. This interest usually exists without an understanding of why Hunter failed to differentiate syphilis from gonorrhea, and confused research for fifty years; of why Withering was able to isolate digitalis as the active ingredient in that brew and so standardize and employ this highly toxic substance that it became the single greatest drug known to man. It was no accident that Withering accomplished what he did, for he was a man of rare talent and broadness of vision. He was able to develop digitalis first because he did not fear that examining some disreputable preparation would lower his professional dignity. He succeeded because his botanical knowledge enabled him immediately to realize from examining the recipe that only digitalis out of the twenty ingredients could possibly have produced the reputed effect. Incidentally, Withering had an enormous knowledge of botany, and for his work in classifying English flora he was known to European botanists as "The English Linnaeus." Other men used his drug, and obtaining either no result or frequent and often fatal toxicity, condemned it. But his perseverance enabled him to continue in his studies. He took great pains to obtain a standard product, and knowing the variability of the roots of biennial plants, finally took only the leaves picked when the plant was two-thirds flowered, since the plant was then in its most steady state. To this day, digitalis leaf is gathered in this manner.

Last year, with the encouragement of Dr. Curran and several members of our faculty, a number of our students organized the Medical History Club, hoping to do what we could to foster in our student body an interest in and appreciation of the history of medicine. We have since held a number of meetings, but have yet to develop a really self-sustaining organization, though I have every confidence that we will succeed. We hoped that our sessions would be a forum for studies made by the members, but these initial hopes have not yet materialized and we have had to rely on faculty or outside speakers to provide our programs. Most of these have been not merely good, but excellent. However, when one invites a speaker because a specific date is open, and the choice is dictated by the availability of a limited number of persons, it is most difficult to provide a program with continuity, one which stresses historical concepts and the development of our present medicine.

We have run up against other problems. Our meetings are not over-

whelmingly well attended, the only really good turnout being to a meeting addressed by a popular member of our own faculty. There are a number of reasons for this: Our student body is scattered over most of Brooklyn, meeting times and places are never convenient to all, and some examination is always in the offing. But the major reason for poor attendance is lack of interest.

Usually this lack of interest arises from ignorance of the values of medical history, for generally when I am challenged as to the importance of medical history, I can cite a reference to the past which will illuminate some problem that we have just been discussing. The questioner may agree that the point made is apt, but failing to conclude that the method itself is valuable, he remains Dr. Holmes' practical man. I feel that our club can be a success only when a real interest in medical history already exists, an interest stimulated and directed by a faculty which believes in its value.

Without condemning that old whipping boy, de-humanized technical education, it is true that we have placed our entire reliance on science, which still cannot give all the answers and requires mature judgment to interpret it. Men like Osler and Welch were given classical educations and were men of letters who appreciated the importance of understanding the past. Their students, however, were already breaking away from this pattern, and the third generation is almost completely in the darkness. Classical education had serious limitations, but we can still attempt to restore those of its features which were valuable.

This should be the function of the colleges, but the medical schools have an obligation to the student to introduce him to the study of medical history and give him some understanding of its value. The introduction to medical history must be attractive, for it is but an entry into the subject, and if we hope for continuing interest, it should be more than a mere mechanical chore. Second, it must attempt to integrate various aspects of medicine, technical, social and philosophic, and relate them to each other in their present and in their past. Especially important would be emphasis on the value of the historical method in clinical medicine, as well as in public health where its value is already appreciated.

I would like to propose an attack on this problem which would add little to the course hours of a crowded program, but would produce appreciable results. In order to be successful all the instructors concerned

would have to be capable and enthusiastic; the problem of faculty might well be the biggest stumbling block in implementing the program.

Throughout the first year, a series of introductory lectures could be given every week, or every other week. The lecturer on the history of medicine should have no other academic obligations outside of medical history, and should be well qualified. He need not be a physician, though I think lectures given by a clinician with graduate training in medical history could be made more relevant to clinical medicine than those given by a layman. The lectures should stress the history of ideas, practices, institutions, discoveries, and disease itself, always pointing from the past to the future. About half the time should be devoted to recent and contemporary history and the student should be enabled to understand the origin and development of medical specialties, modern medical education, hospitals, qualifying boards, and the rest of the enormous newly developed arms and agencies of present-day medicine. The student should be shown how practice and practices have been changing, and the pressures producing these changes. There should be recourse to general history, sociology, philosophy and economics to help gain an understanding of cultural and philosophical trends.

An equivalent period of time should be utilized for more personal seminar type sessions of not more than fifteen students each. These groups would further discuss, read and report on the material covered in the lectures. Additional faculty would be required for this work. I think the ideal way to learn medical history is Osler's method—the enthusiasm and example of an older, more experienced man being conveyed to his students through personal contact.

Not enough emphasis has been placed on medical history by the teachers of the clinical courses, and just as important as the lecture and seminar course would be integrating today with yesterday in clinical studies. An insight into the ideas current at the time of a great discovery, or great confusion, such as Koch's mistaken ideas about tuberculin and bovine tuberculosis, could guide the student in understanding current and future developments in medicine, and in finding his way through the forest of seven day wonders which appear each month in the journals. Three books which show this insight in an admirable fashion, impressing upon us the blind spots in our mental vision as well as the often remarkable insight and ability of our predecessors, are Osler's *Principles and Practices of Medicine*, Homan's *Textbook of Surgery*,

and Ryle's *Natural History of Disease.*

Such a program can be carried out only if all who are responsible for it are firm in the realization of its importance, not as a mere delectation but as something vital to the understanding of our beloved medicine. When our physicians have added to their technical knowledge a greater appreciation of the world with which they deal and of their own profession, they will have come close to the ideal of the Great Physician who wrote: "The physician who is at the same time a philosopher is like the gods."

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NEW YORK PATHOLOGICAL SOCIETY AND NEW YORK ALLERGY SOCIETY

Abstract of Paper and Discussion

Presented at the Meeting, April 30, 1953, at The New York Academy of Medicine

Pathology of Allergic and Related Diseases

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The pathologic changes that result from allergic reactions are the result of injury to tissues and to the inflammatory response to the injury. The anatomy of the lesions is conditioned by the type of injurious stimulus, the responsiveness of the host, the velocity of the reaction between these, and the duration of the process. Therefore no pathognomonic allergic lesions are to be expected, and none is found. There are, however, *characteristic* lesions which can lead one to investigate the allergic nature of a lesion by other means. There is no need to assume that because a process may be the result of allergy it is always the result of allergy.

There are allergic processes in a wide variety of diseases, so that it may be more appropriate, with Cooke, to speak of the allergic component of disease rather than of allergic diseases.

When the variety of allergic and similar lesions is surveyed, they may be divided into a small number of categories according to the dominant histologic features. Since a classification so formed turns out to have important clinical and immunologic correlations, it is a useful classification and aids in the understanding of the pathology of allergic and related diseases. The classification and the correlations are summarized in the following two tables.

DISCUSSION

PAUL KLEMPERER: I would like to start my discussion by referring to Dr. Bohrod's introductory remarks about splitting and lumping. There are certain cycles in medical investigation. If one goes back in the history of medicine to the last century, one finds in the beginning there was splitting, and then came lumping, and then came splitting again. We have not yet reached, except in a few instances, the stage where we can justifiably lump together. Why do we split? Because in our survey of the manifestations which diseases present, we necessarily first break up the totality of the morbid state. With subsequent reflection, some unifying thoughts enter into the diversity of observations. When a common denominator is found, we lump together. That means we generalize. There is always a great advantage in thought, but it must be rational or the generalization is premature and does not help very much. I believe this point applies to certain diseases that are believed to be allergic diseases. It is this subject that I

TABLE I. CORRELATION BETWEEN HISTOLOGIC CLASSES AND CLINICAL AND IMMUNOLOGICAL PHENOMENA IN ALLERGIC DISEASES

	Type of Clinical Reaction	*Clinical Course (Velocity)*	*Duration*	*Skin Reaction*	*Antibody in Serum*	*Increased Serum Globulin*	*Specific Infection*	*Eosinophilia*	*Necrosis*
Necrotizing	Immediate	Rapid	Short	0 or + Necrosis	0 or +	0	0 or +	0 or +	+ + + + (Diffuse)
Anaphylactoid	Immediate	Rapid	Short to moderate	Wheal type	Frequently +	Usually 0		+ to + + + +	+ (Fibrinoid)
Granulomatous									
Tuberculoid	Delayed	Variable	Short to long	Tuberculin type	0	0 to + + +	+	0	+ + (Caseous)
Rheumatoid	Delayed	Slow	Long	0	0	0 to + +	0	0 or +	+ + (Fibrinoid)
Hyalinoid									
Collagen disease	Delayed	Variable	Short to long	0	0	+ +	0	0 or +	+ + (Fibrinoid)
Amyloidosis	Delayed	Slow	Long	0	0	+ to + + + +	0	0	0

TABLE II.

	Examples in Human Pathology	*Examples in Experimental Pathology*	*Nonallergic Mechanisms Which May Produce Changes*
Necrotizing			
Tissue selective	Cortical necrosis of kidney; acute pancreatic necrosis	Arthus and Schwartzman phenomenon	Primary drug injuries
Cell selective	Thrombocytopenic purpura; granulocytopenia	Antiplatelet serum	Primary drug injuries; overwhelming infection
Anaphylactoid	Serum sickness; asthma and hay fever; atopic dermatitis; glomerulonephritis; periarteritis nodosa	Experimental anaphylaxis; experimental nephritis, etc.	All the mechanisms producing *stress* (Selye)
Granulomatous			
Tuberculoid	Tuberculosis; brucellosis; tularemia, etc.; beryllium granulomas	Experimental infections with same organisms	Probably *none*
Rheumatoid	Rheumatic fever; rheumatoid arthritis; "giant-cell" rheumatoid granulomas	?	The mechanisms of stress and the diseases of adaptation (Selye)
Hyalinoid			
Collagen diseases	Disseminated lupus erythematosus; dermatomyositis; scleroderma	None known	The mechanisms of stress and the diseases of adaptation (Selye)
Amyloidosis	Amyloidosis	Parenteral injection proteins or nucleic acids	Neoplasms (multiple myeloma) Others?

would like to discuss, and to get the ideas of Dr. Bohrod in this respect; these are the so-called collagen diseases.[1]

Before we proposed the term "collagen diseases," which is a collective, a lumping term, there was another generalization applied to the same disease group, and that was the idea of allergy. Klinge[2] deserves the credit for having recognized the significance for pathology of systemic connective tissue alterations with particular emphasis on the alterations of the intercellular substances. I always agreed with Klinge, and with those who followed him, that the connective tissue deserves attention. However, I cannot altogether agree with the final generalization of Klinge. The common morphologic denominator of all these diseases he collected is a peculiar alteration of the intercellular substance, referred to as fibrinoid alteration of the connective tissue. Since it has been found in experimental animals made hypersensitive to horse serum, and since there was reason to believe that the streptococcus might be the common etiologic factor in rheumatic fever and in rheumatoid arthritis, Klinge drew the conclusion that fibrinoid degeneration of the connective tissue is not only the pathognomonic tissue alteration of that entire group but is definite evidence of allergy. Dr. Bohrod has stressed that there is no pathognomonic feature which exclusively denotes allergy and I think that this point of view has been borne out in the development of our knowledge of the so-called allergic diseases. When we found, in certain cases of systemic lupus erythematosus, striking systemic changes of the connective tissue showing fibrinoid in the most brilliant manner, it would have been very easy, and it was certainly very tempting, to consider them, also, examples of an allergic disease. Shortly before, scleroderma had been included in this group because of the presence of fibrinoid alteration. It is agreed that we were tempted by the morphologic features, but other factors could not be neglected. One had to consider the clinical picture too, and it had to be emphasized that in lupus erythematosus clear-cut clinical manifestations of allergy are not present. This was one of the main reasons why we did not attribute the fibrinoid alteration in lupus to the mechanism of allergy. Before I go on, I want to say that we also lumped, but in an entirely different manner from Klinge. We collected under

the term "collagen diseases" a group of heterogeneous diseases in all of which there was one common factor, and that is a systemic alteration of the connective tissue. Our level of generalization was much more elementary because we felt that we should first find out more about factors controlling the connective tissue before we enter into pathogenetic generalization. In the last fifteen years a great deal has become known about connective tissue through the studies of very competent investigators in different basic sciences. Unfortunately, contact has not yet been made. Whatever we have learned from the basic sciences about the mucopolysaccharides of the ground substance of connective tissue, whatever we know about the action of hyaluronidase and other enzymes, and as much as we have learned by the brilliant investigations of the collagen fiber by electron-microscopy and x-ray diffraction, all these achievements have not yet helped much to clarify the medical problem. We have to go back to the simple observations of the patient which we, as physicians, make at the bedside or at the autopsy table, and try to center upon the disease manifestations. As for pathologic anatomy, the most crucial manifestation is alteration of the connective tissue. The various vascular lesions shown by Dr. Bohrod, which we are used to calling periarteritis nodosa, have one point in common anatomically—they are necrotizing vascular alterations, often called fibrinoid necrosis. As you know, we can reproduce necrotizing arteritis by various experiments. First came the allergic model experiment of Klinge, and then of Rich[3] and his school. The result was that all the necrotizing arteritides which we see at the autopsy table were regarded as probably of an allergic background. But observations in experimental hypertension of rats showed magnificent necrotizing vascular lesions which simulated periarteritis nodosa as we see it in man, and which histologically also conform to the human lesions. That was a vascular lesion produced by a mechanism other than allergy. Other experimental methods have been found to produce necrotizing arteritis; thus Russell Holman[4] and Muirhead and Grollman[5] produced vascular lesions of a necrotizing character by nephrectomizing dogs and keeping them alive for a number of weeks. I think one of the most impressive experiments that reveals the differences in mechanism by which one can produce necrotizing arteritis is that of Waters[6] at Yale, who produced in dogs the most striking vascular disease with fibrinoid necrosis, by repeated adrenalin injections. Recently Lewis Thomas of Minneapolis showed me coronary arteries of rabbits which had been injected intravenously with streptococcus A and subsequently with meningococcus toxin. The lesions of the coronary arteries were similar to those one finds in the allergic experiment. Since these various experiments produce necrotizing arteritis by different mechanisms, is it not logical to think that the human arterial disease is also produced by different mechanisms? The time is brief, but I want to say there is one way by which we may approach the problem in the old-fashioned manner, by the application of histochemical techniques. The aim must be to distinguish between the different forms of tissue change; in other words, to identify the various forms of fibrinoid. One reason why I think we are wrongly lumping together is the tacit belief that all the fibrinoids are one and the same, and the unfortunate belief that it is a well-defined substance. In recent studies of systemic lupus erythematosus, we have succeeded in finding a connection between the hematoxylin bodies which Dr. Bohrod has shown tonight and the particular fibrinoid substance in this disease. The fibrinoid in lupus is, according to our belief, the protein moiety which finally remains after the complete degradation of the nucleic acid component of the nucleoprotein of the hematoxylin bodies. It must be the aim of future investigations to identify fibrinoid chemically in all the conditions in which it occurs. If we were able to do so, we might be able pathogenetically to separate the individual maladies morphologically thus defined. We cannot be satisfied, and I realize Dr. Bohrod is not, with explaining tissue lesions in human pathology by the assumption that one mechanism only is at work. We must not believe that nature will use just the

one mechanism in the production of diseases which experimenters have happened upon.

JOSEPH HARKAVY: The interesting exposition of Dr. Bohrod indicates clearly that there is no single histologic lesion in diseases of allergic origin. According to him there are several different lesions, each one of which is also seen in non-allergic states. "Their presence does not prove that a disease is allergic and their experimental reproduction does not, in itself, prove that an allergic mechanism has been operating in the experiment. If then the pathologist cannot decide what shall be called allergic he will have to study all those conditions believed to be allergic for any reasons whatsoever, and to add to these, all the instances in which he sees similar anatomic findings." Pathologists, however, do not agree that even similar anatomic findings indicate similarity in pathogenesis. This is emphasized by Dr. Klemperer who in his discussion of lupus indicates that the fibrinoid material in glomerular capillaries and arterial walls present in this disease is due to a specific breakdown of nucleoprotein and is different from the fibrinoid in other morbid conditions. The burden of proof obviously rests with the pathologist. Since however the latter focuses his attention primarily upon tissue changes as such, the task of diagnosing these could be made easier if more emphasis were placed on the clinical history as well as the background of the patient.

The allergist is not only interested in tissue changes which are associated with allergic reactions, but he is primarily concerned with the sick individual, his peculiar response to a given stimulus and the character of the stimulus. Since we do not know the cause of allergy nor what causes the person previously immune to develop a harmful form of allergy, the best the allergist can do for the present is to become a detective, if you will, and ferret out the exciting agents responsible for the presenting symptoms with the aim of eliminating them if possible, or immunizing against them, and thus controlling the disease in question. We know that the atopic, i.e., constitutionally allergic individual will react at an accelerated tempo to a given allergen. The so-called normal who becomes sensitized to drugs or bacteria will, in time, likewise respond in a similar manner. The localization of the response will depend on the number and character of his acquired or inherited shock tissues. The type of reaction in turn is contingent upon the nature of the antigen, and the intensity and sphere of its operation.

The acute reversible manifestations of allergy are usually associated with disturbance in function of the involved organ. Thus the bronchospasm in a paroxysmal asthmatic attack, or the intestinal spasms following food allergy, as well as the vascular reactions involved in migraine, erythema and angioedema, are not accompanied by any morphologic alterations. However, inflammatory allergic reactions, especially those affecting the vascular connective tissue, are followed by pathologic changes. In the early stages the edema, eosinophilic exudate and fibrinoid changes in connective tissue are sufficiently characteristic to be diagnostic of the allergic response. Such reactions have been repeatedly induced in the skin of both man and sensitized animal as a result of the intracutaneous injection of a specific antigen. It is in the late stages and the stage of repair where the question as to whether an allergic mechanism is or is not involved is at issue. Here a careful history, with special reference as to the presence of allergy in the patient or his family, and an analysis of the evolution of the clinical manifestations will greatly help in elucidating the nature of the lesion. Although a positive history of allergy is of importance, its absence does not rule it out. Let me cite a few examples.

In thromboangiitis obliterans, tobacco is generally recognized as an injurious factor. The question is, what is its mode of action? Since many persons smoke just as much as patients with thromboangiitis obliterans and yet do not develop this disease, one is justified in assuming that the affected individual becomes sensitized to tobacco. This concept is supported by the findings of positive skin reactions as well as reagins to tobacco in 78 per cent of patients with thromboangiitis obliterans, correlated with the fact that cessation of smoking arrests the dis-

case, whereas resumption causes its return. Yet the incidence of a personal and family history of allergy in these patients is only about 12 per cent. One must therefore suppose that the others who develop thromboangiitis obliterans have become hypersensitive to tobacco because of excessive smoking. Whether the vulnerability of the blood vessels in these patients is due to hereditary influences or is caused by some antecedent non-specific infection which prepares them, in the sense of Shwartzman, to the sensitizing action of tobacco and/or nicotine, is a problem that awaits further solution.

Five and seven-tenths per cent of patients with thromboangiitis obliterans develop coronary artery disease with thrombosis which may be fatal. In thirty autopsied cases the histologic changes in the coronary vessels varied from simple intimal thickening to severe arteriosclerosis. However, in four reported cases the lesions were typical of thromboangiitis obliterans. In a patient with thromboangiitis obliterans described by Saphir,[7] the coronary vessels on histologic examination showed characteristic severe lesions of thromboangiitis obliterans in some areas, while in others, there were changes that could easily be confused with arteriosclerosis. The myocardium showed diffuse fibrosis with old and organized infarcts. Perla,[8] Telford and Stopford,[9] as well as Mallory,[10] reported similar cases. The question which therefore arises is, is tobacco allergy responsible for the coronary artery disease associated with thromboangiitis obliterans, or is the coronary artery disease in these cases coincidental and in no way related to the peripheral vascular disease? Is coronary sclerosis merely a different stage, the end stage of thromboangiitis obliterans, or a different entity on the basis of thromboangiitis obliterans? Buerger[11] and Saphir[7] believe that as the thromboangiitis lesions get older the histologic changes that were specific for thromboangiitis obliterans become less and less characteristic and only fibrosis and hyalinization remain. In Saphir's case the giant cell foci in the region of the atheromatous ulcer persisted, indicating that "the causative agent was still operative."

That antecedent inflammatory vascular lesions may be the basis for arteriosclerosis is evident in the development of the latter in primary syphilitic aortitis or in coronaries which are the seat of rheumatic disease in young people. In both of these allergic factors may be at play. The concept that an arteritis in which there is an allergic mechanism may be present as a precursor of human coronary arteriosclerosis has had numerous advocates. It is championed by von Albertini[12-14] who distinguishes a primary form of arteriosclerosis from a secondary one which is superimposed on an intima thickened by transitory episodes of recurrent inflammation. Stenosing arteritis, according to Zak,[15] which occurs in young individuals, progresses, just as in thromboangiitis obliterans, in periods of exacerbation which are characterized histologically by an acute transient inflammation resulting in deposition of intima fibrinoid which becomes incorporated into the vessel wall. This ultimately interferes with the blood supply and brings about complete occlusion by a superimposed thrombus. The end stage of stenosing arteritis in patients who survive the acute episodes is indistinguishable from the genuine or primary form of arteriosclerosis. This was illustrated in a patient forty-three years of age with thromboangiitis obliterans studied by us, who had hay fever and urticaria and was found sensitive to tobacco. He smoked 40 cigarettes daily for many years. After smoking he developed headaches and vertigo. He stopped smoking and these symptoms disappeared. One day, however, following the usual number of cigarettes, he not only experienced headache and vertigo, but developed loss of consciousness, a right hemiplegia, facial paralysis and loss of speech. This episode was followed by almost complete recovery within a few days. He was advised to stop smoking and felt well until he began again. Thereupon he developed another attack of hemiplegia, etc. This happened three times after smoking. After the third time he was operated on because of a suspicion of tumor. All that was found was a collection of fluid over the left cerebral hemisphere. The fluid was drained and oxygen injected. In view of the history of recurrent episodes of loss of

consciousness followed by hemiplegia and aphasia with fairly complete recovery, it was concluded that the symptoms were due to vascular disease in the nature of repeated spasm or thrombosis followed by softening of the left cerebral hemisphere. Ten days after the operation the man experienced another attack of vertigo; he was unable to walk and gradually went into coma from which he never recovered. Postmortem examination of the brain disclosed thrombosis of the superior longitudinal sinus with secondary thrombosis of the superior cerebral veins bilaterally, encephalomalacia of the brain stem due to arteriosclerosis and left cerebral atrophy due to arteriosclerosis. It may be conjectured that the latter probably indicated the end stage of an antecedent arterial involvement similar to that seen in thromboangiitis obliterans, but indistinguishable from other forms of arteriosclerosis. Similar cases have been reported by Hausner and Allen.[16]

That tobacco allergy may play a role in cases of coronary artery disease in patients without thromboangiitis obliterans is suggested in a study of a group of 100 cases with this condition previously reported by us.[17] In 33 per cent of patients who reacted to tobacco, there was a personal or family history of allergy. This incidence is only about 17 per cent less than is obtained in patients with bronchial asthma. The significance of this observation is that in such constitutionally allergic individuals, the coronary vessels and the myocardium may be the shock organ. Abnormal reactions in the latter in the form of angina and coronary insufficiency may be the result of hypersensitiveness to various exciting agents of which one of the important ones may be tobacco.

Other sensitizing substances, drugs, such as aspirin, penicillin, foods and inhalants, such as pollens, have also been implicated in the causation of coronary insufficiency. It does not require any great stretch of imagination to realize that continuous sensitization by such agents may lead, as in the case of chronic vasomotor rhinitis, to irreversible changes in the vessel walls, ultimate sclerosis, and myocardial damage.

The recognition that certain forms of diffuse vascular disease may be mediated by an allergic mechanism has gained support from their not infrequent occurrence in individuals with asthma. In such patients respiratory infections have been regarded as one of the principal sources of sensitization. Since the increased use of antibiotics in therapy, drugs such as penicillin and sulfa have been found to be equally important as sensitizing agents in the development of hyperergic vascular disease. The immunologic specificity of drug allergy has, as you know, been established on a firm basis by the brilliant work of Landsteiner,[18] Chase[19] and others. Experimentally drugs and bacterial agents have been found to induce hyperergic vascular disease characterized by various degrees of arteritis, periarteritis and in the later stages fibrosing arteritis. Even though fibrosing arteritis may not indicate antecedent allergy to the pathologist, if one follows the clinical history of the patient the pathogenesis becomes clear. As a striking example of this I wish to cite the case of a patient who suffered with asthma as far back as 1935. The asthma was accompanied by eosinophil cells varying between 65 to 82 per cent. When he came under observation in 1941, although he still had asthma, he was in cardiac failure. His white cell count was 16,000 with 85 per cent polynuclear cells and there was a complete absence of eosinophil cells. The question arose whether the asthma was of cardiac origin. The patient died. At autopsy he showed emphysema, pulmonary infarction, endophlebitis of the inferior vena cava with thrombosis, extensive fibrosis throughout the myocardium and striking vascular changes characterized by thickening of small and medium-sized arteries. Dr. Klemperer, who examined the tissues, commented that "the exact nature of the arterial process cannot be ascertained because the lesions were healed in the anatomic sense. It is probable, however, that the destruction of the arterial wall was preceded by an arteritis. The fibrosing pericarditis as well as the fibrosing lesion in the retroperitoneal tissue was of great significance in the clinical picture. One is inclined to think in this case of a morbid process affecting collagen tissue. Of course

the obvious diagnosis suggested by this widespread involvement of vessels, such as rheumatic fever, or periarteritis nodosa, cannot be made." If, however, we take into consideration the clinical history of this patient, such as the record of asthma associated with eosinophilia, the diagnosis of hyperergic vascular disease in the healing stage becomes highly suggestive.

Turning finally to lupus erythematosus the question whether allergy plays a role in this disease is debatable. The proponents of the allergy theory rest their case on 1) the presence of fibrinoid connective tissue lesions in the postmortem material, 2) elevation of gamma globulin, and 3) beneficial effects of cortisone. Teilum[20] regards the periarterial splenic fibrosis and glomerular wire loop lesions as expressing an allergic hyperglobulinosis.

The opposition, led by Klemperer[21] and his school, argue that "L. E." cells have not been found in other conditions except in systemic lupus. The presence of hematoxylin bodies which represent a specific breakdown of nucleoproteins results in deposition of fibrinoid material in glomerular capillaries and arterial walls. Because of its origin this fibrinoid material differs from that seen in other conditions which are not distinguished by the same metabolic alteration and hence must be of a different nature.

Such arguments, however, do not exclude the possibility that in some instances allergy may play a role.

In the first place, "L. E" cells, although most frequently found in lupus, have been reported in other conditions, most recently in three cases of penicillin sensitivity.[22] The plasma factor capable of inducing "L. E." cells from normal marrow cells may therefore be in the nature of an autoantigen developed in the course of the disease as a result of an erstwhile sensitization by some X substance. In the second place, the presence of hematoxylin bodies which results in the deposition of fibrinoid material does not represent etiology. Is it not possible that the lupus patient may have a disturbance of nucleoprotein metabolism manifested by depolymerization of the desoxyribonucleic acid of mesenchymal cell nuclei which may represent a peculiar metabolic defect, just as a disturbance of the uric acid metabolism does in the gouty individual? May not therefore the acute attacks of lupus be induced by allergenic as well as other types of stimuli just as the acute attacks of gout? We know that the latter may be precipitated by allergens such as wines, foods, drugs, or pollens, as well as trauma of various kinds.

For the past three years I have been observing a patient with lupus in whom the symptoms of rash, arthritis and fever of 102 to 103°F. appeared every May, June and August for over six years. A severe attack in 1951 was associated with a pneumococcus bacteremia. This was successfully treated with penicillin and cortisone. The history of attacks during the summer months suggested pollen sensitivity. This was confirmed by tests and the ability to induce a rash, arthritis and fever following the injection of as little as 75 units of specific pollen such as grasses and plantain, on repeated occasions. This patient was also sensitive to foods, as well as nickel. The latter produced a rash on contact. Despite the continuous presence of "L. E." cells in this patient's bone marrow, she has been symptom-free, after discontinuing the cortisone, for almost two years under treatment for her pollen and food allergy.

This does not mean that every case of lupus is due to allergy, but cases have been reported following sensitization to hair dye, sulfonamides and penicillin, as well as light sensitivity in which the presence of photosensitizing substances in the blood might account for the cutaneous lesions. The possibility that allergy to infectious agents or a virus may also play a role in lupus cannot be excluded. There is obviously much to be done in the elucidation of the nature of this disease. Success can be achieved by the close collaboration of men trained in various fields which will include not only the pathologist but the allergist as well.

DR. BOHROD: I want to thank Dr. Klemperer and Dr. Harkavy for their very fine discussions. I hardly think there is any need to answer them, rather I might

elaborate on them, for there is, I think, essential agreement among us. At dinner tonight some of us were talking about the difference between Science and Philosophy. I maintained—I do not know how convincing I was—that we could not separate the two, and I think the discussion bears out the fact that others cannot seem to get away from philosophizing, not for very long, anyway.

Dr. Harkavy has mentioned the interest of the clinician in the individual patient, as though this is perhaps opposed to the pathologist's consideration. We must remember that when an individual patient gets sick he develops a picture which you see clinically and which I see pathologically, which is the result of everything that has ever happened to him and everything that has ever happened to his ancestors. We cannot detail the entire history of the universe every time we give a diagnosis to a clinician, so we have to select our facts, and our selections are of necessity incomplete. What I am getting at is that most of the items we pick out as valid are things that we choose, as Dr. Klemperer said, not that Nature picks out. These facts we use in devising our classifications.

It is our fondest error to say that we make classifications on an etiologic basis. The truth is that we assign etiology according to the classifications we make. If we decide to classify diseases according to the microorganism that is found, we say that that microorganism is the cause of the disease. If we decide to call "tuberculosis" only those lung diseases in which we find tubercle bacilli and refuse to call "tuberculosis" those anatomically and clinically similar lesions in which we find fungi, then it is no wonder that tubercle bacilli are the only and always the *cause* of tuberculosis.

Do we have to take clinical features into consideration? Of course we do. You will remember that Virchow never would consent to believe that the disease called tuberculosis and the disease called scrofula were the same disease because they were so different clinically. In one sense he was perfectly correct, in another he was not. What we call *a* disease is a matter of our own choice and the choice may be made on pathologic, bacteriologic, or on clinical grounds, whichever is at the moment most useful. Even experiment is not always the best guide for assigning cause and it is necessary that we know exactly what an experiment proves. If we produce a lesion by experimental means all we have done is to show that the method used is a competent cause. It does not mean that there may not be a dozen other causes or that the one used in the experiment operates in spontaneous disease at all.

I am as interested as anyone in histochemical methods. I do not believe, however, that showing histochemical identity between substances found in two conditions proves that a mechanism which we are studying is present in both conditions, or that histochemical difference proves that they have entirely different mechanisms.

It is commonly believed that for application to the individual patient we must go beyond Science. I do not believe this, and I think that much confusion comes from such a belief. It is the highest Science to recognize that conditions are always complex; that multiple causes and multiple clinical pictures are the rule. The setting up of single "causes," one for each "disease," is one of the most artificial activities in which a scientist can engage. It is the height of medical science to find all the conditions that operate in what we call individual diseases. We may group these diseases according to any mechanism they possess in common if such grouping is of any use to us, or separate them if that is useful. There is no need to be either a "lumper" or a "splitter." Both activities are indispensable.

The problem of classification of disease is illustrated by the question of acute lupus erythematosus. Here is an example. We had a patient who had rheumatoid arthritis for fifteen years. No one questioned the diagnosis during all that time. Recently she developed a big spleen and leukopenia, and her spleen was removed. There were some minor changes around the splenic artery, a laminar fibrosis, which looked a little like what we find in lupus erythematosus, and the clinician thought it might be interesting to see what the bone marrow

showed. It was loaded with "L. E." cells. Some of our "high-powered" residents became very critical of the diagnosis: it had been wrong all the time and the patient had really had lupus erythematosus. Was that true? Or did the patient have lupus erythematosus of which rheumatoid arthritis was a part? Or did she have rheumatoid arthritis and then develop lupus erythematosus? Or is this an instance of the occurrence of "L. E." cells in rheumatoid arthritis? Whatever the truth is, it is partly dependent upon just how we define rheumatoid arthritis and lupus erythematosus. In any event there is indication that these two conditions have mechanisms in common, that somehow they belong together.

One question brought up by this last case, which is not an isolated one, is the possibility that the L. E. phenomenon may have a wide quantitative range. It is possible that a variety of conditions, rheumatoid arthritis among them, may show quantities of the responsible substance, which are above normal but too small to reach the threshold value necessary to produce the biologic test we now use. Until quantitation of the L. E. phenomenon is possible it will be difficult to answer the question.

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TWENTY-SEVENTH ANNUAL GRADUATE FORTNIGHT

THE NEW YORK ACADEMY OF MEDICINE

2 East 103 Street, New York

INFECTIONS AND THEIR MANAGEMENT

OCTOBER 18—29, 1954

EVENING LECTURE PROGRAM

MONDAY, OCTOBER 18

PRESIDENTIAL ADDRESS
ALEXANDER T. MARTIN

A METABOLIC APPROACH TO THE PATHOGENESIS OF TUBERCULOSIS
Ludwig Kast Lecture
RENE J. DUBOS, Professor of Pathology and Bacteriology, Rockefeller Institute for Medical Research

CURRENT METHODS IN THE TREATMENT OF TUBERCULOSIS
Harlow Brooks Lecture
J. BURNS AMBERSON, Professor of Medicine, College of Physicians and Surgeons, Columbia University

TUESDAY, OCTOBER 19

ALTERATIONS IN PATHOLOGY IN INFECTIONS SINCE THE INTRODUCTION OF CHEMOTHERAPY AND ANTIBIOTICS
Wesley M. Carpenter Lecture
PAUL R. CANNON, Chairman, Department of Pathology, The University of Chicago, Chicago, Illinois

ACUTE NON-PURULENT MENINGITIS
YALE KNEELAND, JR., Associate Professor of Medicine, College of Physicians and Surgeons, Columbia University

WEDNESDAY, OCTOBER 20

EVALUATION OF IMMUNOLOGIC METHODS IN THE CONTROL OF POLIOMYELITIS
THOMAS FRANCIS, JR., Professor and Chairman, Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor, Michigan

VIRAL HEPATITIS
RODERICK MURRAY, Assistant Chief, Laboratory of Biologies Control, National Microbiological Institute, National Institutes of Health, Bethesda, Maryland

THURSDAY, OCTOBER 21

THE ROLE OF A NEW GROUP OF PREVALENT VIRUSES IN UNDIFFERENTIATED RESPIRATORY ILLNESSES
ROBERT J. HUEBNER, Chief, Section on Virus and Rickettsial Diseases, Laboratory of Infectious Diseases, National Microbiological Institute, National Institutes of Health, Bethesda, Maryland

INTERACTIONS OF HOST, MICROBE AND CHEMOTHERAPEUTIC AGENT
COLIN M. MacLEOD, Professor of Microbiology, New York University College of Medicine

FRIDAY, OCTOBER 22

THE EPIDEMIOLOGY OF HEMOLYTIC STEPTOCOCCAL INFECTIONS
C. H. RAMMELKAMP, Professor of Medicine, Western Reserve University Medical School and Director of Streptococcal Disease Laboratories, Warren Air Force Base, Wyoming

THE USE OF ANTIBIOTICS FOR THE PREVENTION OF RHEUMATIC FEVER
GENE H. STOLLERMAN, Medical Director, Irvington House; Instructor in Medicine, New York University College of Medicine

(Program continued on following pages)

MONDAY, OCTOBER 25

CURRENT STATUS OF THE DEVELOPMENT OF ANTIMICROBIAL AGENTS
GLADYS L. HOBBY, Ph.D., Research Division, Chas. Pfizer & Co., Inc.

THE COMPLICATIONS OF ANTIBIOTIC THERAPY
LOUIS WEINSTEIN, Associate Professor of Medicine, Boston University School of Medicine and Lecturer on Infectious Diseases, Harvard Medical School

TUESDAY, OCTOBER 26

HORMONES AND INFECTION
LEWIS H. THOMAS, Professor of Pediatrics and Medicine, The Pediatric Research Laboratories of the Heart Hospital, University of Minnesota Medical School, Minneapolis, Minnesota

STAPHYLOCOCCUS INFECTIONS
VERNON KNIGHT, Associate Professor of Medicine, Vanderbilt University Medical School, Nashville, Tennessee

WEDNESDAY, OCTOBER 27

LOW RESISTANCE TO INFECTIONS: RELATIONSHIP TO ABNORMALITIES IN GAMMA GLOBULIN
DAVID GITLIN, Instructor in Pediatrics, Harvard Medical School

PRESENT DAY CONSIDERATIONS OF THE RABIES PROBLEM
HORACE L. HODES, Director, Department of Pediatrics, The Mount Sinai Hospital; Clinical Professor of Pediatrics, College of Physicians and Surgeons, Columbia University

HISTOPLASMOSIS
C. W. EMMONS, Ph.D., Mycologist, National Microbiological Institute, U.S. Public Health Service; Professorial Lecturer, George Washington University Medical School, Washington, D.C.

THURSDAY, OCTOBER 28

THE ACUTE DIARRHEAL DISEASES OF BACTERIAL ORIGIN
F. S. CHEEVER, Professor of Microbiology, Graduate School of Public Health, University of Pittsburgh

EVALUATION OF DIAGNOSTIC TESTS IN INFECTION
CALDERON HOWE, Associate in Microbiology, College of Physicians and Surgeons, Columbia University

FRIDAY, OCTOBER 29

APPROACHES TO THE CHEMOTHERAPY OF VIRAL INFECTIONS
FRANK L. HORSFALL, JR., Member, Rockefeller Institute for Medical Research

ANTIBIOTIC THERAPY OF VIRAL AND RICKETTSIAL DISEASES
JOSEPH E. SMADEL, Director, Division of Communicable Diseases, Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D.C.

REGISTRATION FEES — NON-FELLOWS

Fellows of The New York Academy of Medicine will be furnished registration cards without application and without fee. A registration card will be sent to Non-Fellows upon receipt of check, payable to *The New York Academy of Medicine*, for $10.00 for the entire program, $6.00 for *either the first or second week*.

Medical Officers of the Armed Services, in uniform, will be admitted without charge.

Interns and Residents will be admitted without charge, provided they present letters from their Chiefs of Service. They will be seated as facilities permit, after Fellows of the Academy and other registrants have been accommodated.

TWENTY-SEVENTH ANNUAL GRADUATE FORTNIGHT

MORNING PANEL PROGRAM

11:00 A.M. at the Academy

First Week

Monday, October 18

FEVER OF UNDETERMINED ORIGIN

Chairman: Hamilton Southworth

Members: J. Burns Amberson
Joseph H. Burchenal
Yale Kneeland, Jr.
Currier McEwen

Wednesday, October 20

LOCAL USE OF ANTIBIOTICS AND PROTEOLYTIC ENZYMES IN SURGICAL INFECTIONS

Chairman: Louis M. Rousselot

Members: To be Announced

Friday, October 22

MANAGEMENT OF NON-TUBERCULAR PULMONARY INFECTIONS

Chairman: Dickinson W. Richards

Members: Alvan L. Barach
Perrin H. Long
William S. Tillett

Second Week

Monday, October 25

THE MANAGEMENT OF REGIONAL INFECTIONS

Chairman: Yale Kneeland, Jr.

Members: David V. Habif
John K. Lattimer
Carl T. Nelson
Louis Weinstein

Wednesday, October 27

COMBINED MEDICAL AND SURGICAL TREATMENT OF TUBERCULOSIS

Chairman: Walsh McDermott

Members: Aaron D. Chaves
James G. Hirsch
Herbert C. Maier
Carl Muschenheim
Robert Yeager

Friday, October 29

THERAPY OF AMEBIASIS AND OTHER PARASITIC INFECTIONS

Chairman: Harry Most

Members: Harold W. Brown
B. H. Kean
Elmer H. Loughlin
Howard B. Shookhoff

TWENTY-SEVENTH ANNUAL GRADUATE FORTNIGHT

HOSPITAL CLINICS PROGRAM

CALENDAR OF CLINICS

All Clinics will be held from 2 to 5 P.M.

First Week

Monday, October 18	1. Flower-Fifth Avenue *Hospital Representative:* DAVID LEHR
Tuesday, October 19	2. Mount Sinai *Hospital Representative:* SOLOMON SILVER
Wednesday, October 20	3. Veterans Administration *Hospital Representative:* JULIUS WOLF
Thursday, October 21	4. Presbyterian *Hospital Representative:* HARRY M. ROSE
Friday, October 22	5. St. Vincent's *Hospital Representative:* CARLOS G. DE GUTIERREZ-MAHONEY

Second Week

Monday, October 25	6. Bellevue *Hospital Representative:* ALPHONSE TIMPANELLI
Tuesday, October 26	7. Willard Parker *Hospital Representative:* JEROME L. KOHN
Wednesday, October 27	8. New York *Hospital Representative:* RALPH TOMPSETT
Thursday, October 28	9. St. Luke's *Hospital Representative:* CHARLES G. ADSIT, JR.
Friday, October 29	10. Lenox Hill *Hospital Representative:* ARTHUR F. ANDERSON

SCIENTIFIC EXHIBIT

As in past years, a comprehensive Scientific Exhibit will be an integral part of the 1954 Fortnight.

MONTHLY PANEL MEETINGS ON THERAPEUTICS FOR THE GENERAL PHYSICIAN

1954—1955

Fridays at the Academy—4:30 P.M.

NOVEMBER 5, 1954 — **HEADACHE: ITS ETIOLOGY AND MANAGEMENT**
Moderator: H. HOUSTON MERRITT

DECEMBER 3, 1954 — **THE STATUS OF SURGERY IN THE MANAGEMENT OF CARDIAC CONDITIONS**
Moderator: CLARENCE DE LA CHAPELLE

JANUARY 7, 1955 — **PREVENTIVE USE OF PSYCHOTHERAPY IN CHILDHOOD**
Moderator: LAWRENCE S. KUBIE

FEBRUARY 4, 1955 — **THE EFFECTS OF TOBACCO SMOKING**
Moderator: SAMUEL W. LAMBERT, JR.

MARCH 4, 1955 — **PARKINSON'S DISEASE: MEDICAL AND SURGICAL MANAGEMENT**
Moderator: SAMUEL BROCK

APRIL 1, 1955 — **MANAGEMENT OF PANCREATITIS**
Moderator: CHARLES F. WILKINSON, JR.

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MEDICAL RESEARCH FORUM

to be held by

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THE NEW YORK ACADEMY OF MEDICINE will hold a Forum for Medical Research during the coming academic year 1954-1955. By accepting only a limited number of presentations of new and original work, the Committee hopes to present an interesting program of current clinical research. Investigators may present results of original research in clinical medicine at this Forum, to be held Wednesday, January 26, 1955, at 8:00 P.M.

This Forum is being arranged by the Committee on Medical Education of the Academy with the following stipulations:—

1. **Presentations will be confined to *recent* original research in clinical medicine, surgery, or to research which is applicable to medicine or surgery in all clinical branches.**
2. **Presentations should be reports of work done within the last year or of progress in a continuing project. Previous submission to or presentation before a society will not prejudice the opportunity for presentation at the Forum.**
3. **In submitting applications, the investigator is requested to state whether this work has been published, in toto or abstract, or has been submitted for publication; also, in cases where the investigator is working under the head of a department of a hospital or research institute, approval of the head of department is requested.**

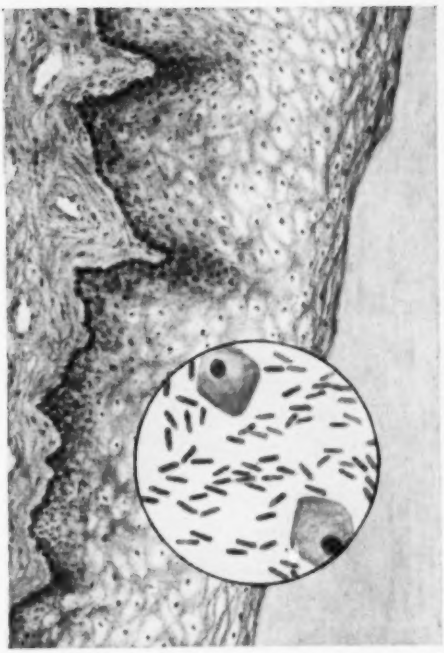
Presentations will be limited to twelve minutes. A period of free discussion will follow each presentation.

The publication of presentations is not a necessary condition but the Academy plans to publish promptly abstracts of presentations, if the author so desires. In order to expedite publication of abstracts, the Committee requests that the abstract submitted by the investigator be carefully prepared in the form in which publication is desired, with the understanding that publication of the abstract in the *Bulletin* of the Academy shall not preclude publication by the author in any other journal.

The Committee extends an invitation to all research workers of Greater New York to submit *an abstract of proposed presentation in QUADRUPLICATE*, not to exceed 500 words in length, to the Secretary of the Committee on Medical Education of the Academy *during September and October 1954 and not later than November 1, 1954.* A formal invitation to participate in this program will then be extended by the Committee to the authors of papers selected for presentation.

ROBERT L. CRAIG, M.D., *Executive Secretary*
Committee on Medical Education
The New York Academy of Medicine

Senile vaginal epithelium is low in glycogen, low in acid and (inset) low in protective Döderlein bacilli, encouraging growth of pathogenic organisms.



Normal vaginal epithelium is high in glycogen, is definitely acid and (inset) contains adequate Döderlein bacilli to combat pathogenic organisms.

Restoring the Normal Acid Barrier to Trichomonal Vaginal Infection

To discourage multiplication of trichomonads and to encourage physiologic protective mechanisms, a comprehensive therapeutic regimen with Floraquin® is instituted.

The normal vagina, by reason of its acid reaction, is provided with a natural barrier against pathogenic microorganisms which require an alkaline medium. When the "acid barrier" is removed, a hypo-acid state results and growth of the protective, physiologic and nonpathogenic Döderlein bacilli is inhibited—to be replaced by such pathogenic organisms as the trichomonad, streptococcus, staphylococcus, colon bacillus and Monilia candida.

As infection develops, the epithelial cell layers, which normally number between forty-five and fifty-five, may decrease to as few as fifteen to twelve layers or may disappear entirely. With this loss of glycogen-bearing cell layers, the available carbohydrate released by physiologic desquamation into the vaginal secretion and ultimately converted into lactic acid is proportionately decreased.

Floraquin not only provides an effective trichomonacide (*Diodoquin®*), destructive to pathogenic organisms, but furnishes sugar and boric acid for reestablishment of the normal vaginal acidity and regrowth of the normal protective flora. G. D. Searle & Co., Research in the Service of Medicine.

POSTGRADUATE RADIO PROGRAMME OF

THE NEW YORK ACADEMY OF MEDICINE

arranged by THE COMMITTEE ON MEDICAL INFORMATION

in cooperation with THE COMMITTEE ON MEDICAL EDUCATION

and THE NEW YORK CITY CANCER COMMITTEE

THURSDAYS – 9:00 P.M. – 10:00 P.M. Station WNYC-FM – 93.9 megs.

AUGUST 5 HORMONES OF THE ANTERIOR PITUITARY GLAND—Abraham White, Ph.D., *Lecturer in Biochemistry, College of Physicians & Surgeons, Columbia University, New York.*

CANCER OF THE SKIN—Eugene F. Traub, *Director and Professor, Department of Dermatology, New York Medical College, New York.*

AUGUST 12 PAUL EHRLICH IN CONTEMPORARY SCIENCE—Cornelius P. Rhoads, *Scientific Director, Memorial Cancer Center, New York.*

THE MANAGEMENT OF INTRACTABLE PAIN IN THE CANCER PATIENT—Isidore M. Tarlov, *Director, Department of Neurology and Neurosurgery, Flower & Fifth Avenue Hospitals, New York.*

AUGUST 19 THE PROBLEMS OF TRANSFUSIONS—(Panel)—Peter Vogel, *Moderator, Associate Physician for Hematology, Director of the Blood Bank, The Mount Sinai Hospital, New York,* with Eugene Katzin, Allyn B. Ley, I. Herbert Scheinberg and Alexander Wiener.

RECENT ADVANCES IN ISOTOPE THERAPY—Frank J. Borrelli, *Director and Professor, Department of Radiology, Flower & Fifth Avenue Hospitals, New York.*

AUGUST 26 PAUL EHRLICH—MAN AND SCIENTIST—Ernst Jokl, *Valley Forge Heart Research Institute, Fairview Village, Pa.*

LIMITATIONS OF X-RAY IN THE DIAGNOSIS AND TREATMENT OF CANCER—Frank J. Borrelli, *Director and Professor, Department of Radiology, Flower & Fifth Avenue Hospitals, New York.*

PHOTOGRAPH BY MILTON GREENE

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Current investigations indicate BENEMID also retards and prevents deposition of new tophi. Old tophi diminish and sometimes disappear altogether.[3]

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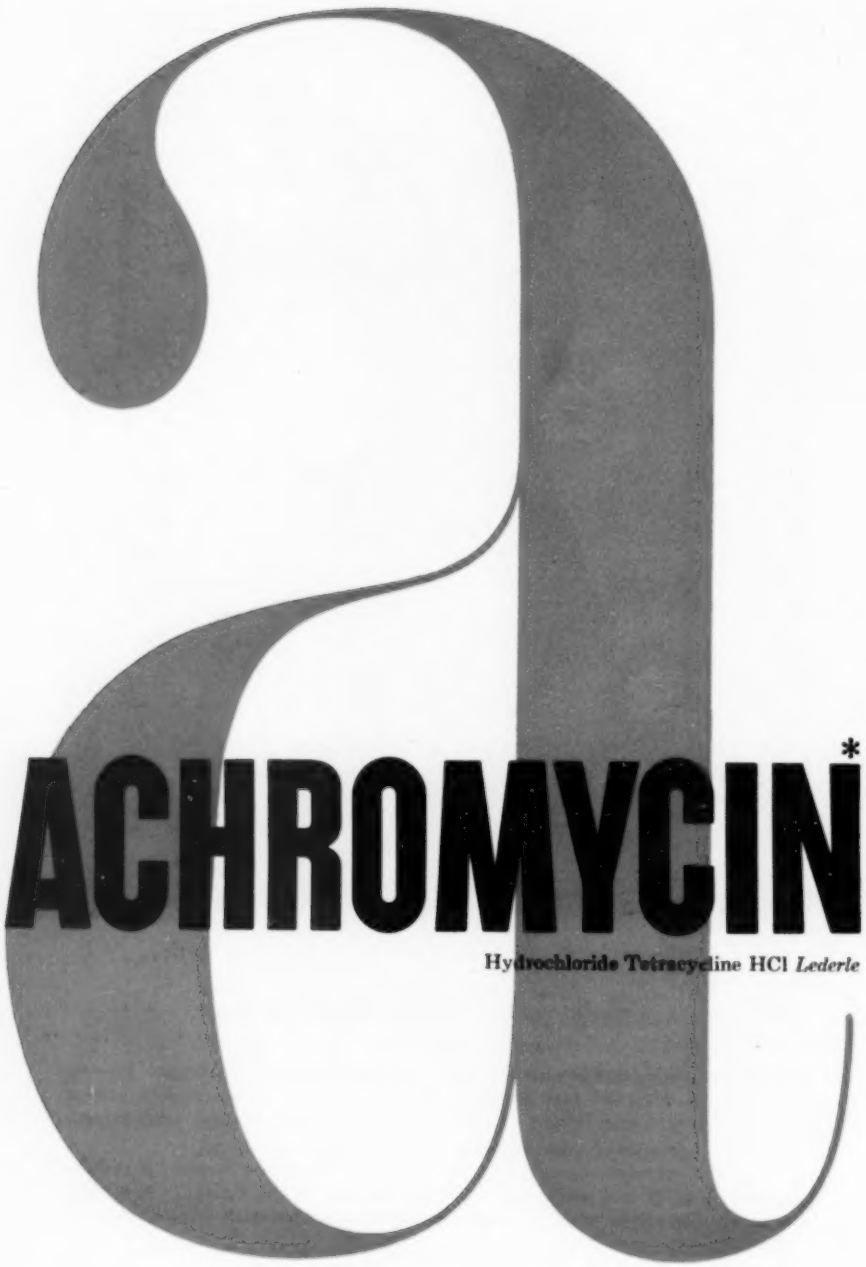
References: 1. J.A.M.A. 149:1188, July 26, 1952. 2. Bull. Vancouver M.A. 29:306, 1953. 3. Current Med. Digest: 20:9, Sept. 1953.



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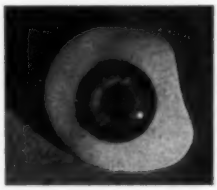

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1. Meller, R. L., and Resch, J. A.: *Bull. Univ. Minnesota Hosp.*, 20:78, Oct. 8, 1948.
2. Meller, R. L., and Resch, J. A.: *Postgrad. Med.*, 6:452, Dec., 1949.

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